# An EU competition law analysis of online display advertising in the programmatic age

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**ABSTRACT**
Online display advertising represents a large source of revenues for online publishers. Because of its vital importance for publishers and advertisers, competition in the advertising ecosystem is desirable. Yet, in the "programmatic" era, the sector is characterized by a high degree of opacity and some of its segments seem to be dominated by Google, with concerns being expressed that it may engage in anti-competitive strategies. Against this background, the purpose of this paper is to explore the display advertising ecosystem and discuss relevant competition law issues. It first discusses market definitions and shows that Google may be dominant on several ad tech markets and then describes how programmatic advertising functions in practice. Finally, the paper identifies several practices which may amount to abuse of a dominant position in breach of Article 102 TFEU.

## I. Introduction

Since the first-ever clickable banner ad for AT&T appeared on HotWired.-com in October 1994,[1] online advertising has evolved into a major business, with an estimated global turnover exceeding 260 billion dollars in 2018.[2] Online advertising represents a major stream of

[1]See <http://thefirstbannerad.com/>.
[2]Source: Statista <www.statista.com/outlook/216/100/digital-advertising/worldwide>.

revenue not only for tech giants offering popular services monetized by ads, such as Google, Twitter and Facebook, but also for thousands of website owners, from major online newspapers with millions of readers to blogs catering for specialized audiences. In 2017, online advertising represented 98% of Facebook's revenues,[3] as well as more than 86% of Google's and Twitter's earnings.[4] The same year, the New York Times Company, which owns the eponymous journal, earned approximately one third of its total revenues from online advertising,[5] the rest of its revenues being essentially generated through subscription fees.

The ever-growing popularity of online advertising reflects the growth of the Internet, which has now become the most popular medium advertising format, ahead of linear TV.[6] Other than the increased penetration of Internet usage worldwide, the main catalyst for this development is linked to the unprecedented ability offered by online advertising tools and technologies (collectively referred hereafter as "ad tech") exploiting various categories of user data to target audiences that are interested in specific products or services.[7]

While *search* advertising represents a large part of the online advertising industry, this paper focuses on what is referred to as *display* advertising since, it represents a large, and in some cases the only, source of revenues not only for large tech companies, but also for a myriad of publishers, large and small, which offer valuable content to Internet users.[8] But for online display advertising, many such publishers would not

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[3]Facebook Inc., Form 10-K filed to SEC, 'Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Year Ended December 31, 2017' 64 <http://d18rn0p25nwr6d. cloudfront.net/CIK-0001326801/c826def3-c1dc-47b9-99d9-76c89d6f8e6d.pdf>.

[4]Alphabet Inc., Form 10-K filed to SEC, 'Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Year Ended December 31, 2017' 58 <https://abc.xyz/investor/ static/pdf/20171231_alphabet_10K.pdf?cache=7ac82f7>; Twitter Inc., Form 10-K filed to SEC, 'Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Year Ended December 31, 2017' 104 <www.viewproxy.com/Twitter/2018/AnnualReport2017.pdf>.

[5]The New York Times Company, Form 10-K filed to SEC, 'Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the fiscal year ended December 31, 2017' 55 <https://s1.q4cdn. com/156149269/files/doc_financials/annual/2017/Final-2017-Annual-Report.pdf>. Subscription revenues make up the most of the remaining two thirds of the total revenues. One can discern a downward trend in the advertising revenue of the company: in 2017 revenue from advertising accounted for 33% of total revenues, as opposed to 37% and 40% in 2016 and 2015, respectively.

[6]G. Slefo, 'Desktop and Mobile Ad Revenue Surpasses TV for the First Time' *AdAge* (26 April 2017) <https:// adage.com/article/digital/digital-ad-revenue-surpasses-tv-desktop-iab/308808/>.

[7]Targeting is an advertising technique that consists of customizing promotional content delivered to users on the basis of criteria such as their browsing behaviour or interests (behavioural targeting), the theme and content of a website (contextual targeting), the geographical location of an individual (geographical targeting), their social, demographic and economic characteristics, such as age, gender, income, etc. (sociodemographic targeting), or the time, day or week (time targeting). The definition is derived from the Opinion no. 18-A-03 of 6 March 2018 on data processing in the online advertising sector (available in English at <www.autoritedelaconcurrence.fr/doc/avis18a03_en_.pdf>) 121.

[8]For the distinction between search and display advertising, see *infra* 5.

subsist, and the Internet would be impoverished. Display advertising is also critical to advertisers, in particular when they seek to raise "brand awareness" among consumers.

Because of its vital importance to advertisers and publishers, healthy competition in the advertising ecosystem is desirable. Yet, despite the spectacular growth of online display advertising, the picture is not entirely rosy. In the "programmatic" era, where ad inventory is sold through computerized decision-making processes managed by "ad tech" intermediaries, the online display advertising sector is characterized by a high degree of opacity, and publishers and advertisers have expressed concerns about the so-called "ad tech tax", i.e. the large and opaque fees applied by various intermediaries.[9] For instance, The Guardian revealed in 2016 that "in worst case scenarios, for every pound an advertiser spends programmatically only 30 pence actually goes to the publisher", meaning that ad tech intermediaries could extract up to 70% of programmatic revenues.[10] Moreover, while the ad tech sector comprises a wide variety of intermediaries, its main segments are dominated by Google, with concerns being expressed that it may engage in both exploitative and exclusionary strategies.[11]

It is thus not surprising that competition authorities are looking closely at the competitive dynamics in online advertising. The French Competition Authority launched in 2016 a sector enquiry in the online advertising sector, followed by a stakeholder consultation. On 6 March 2018 the Autority made public its opinion, "in which it analyses a very complex market, characterized by a fragile competitive equilibrium" (the "FCA Opinion").[12] The German Competition Authority announced on 1 February 2018 that it was launching its own sector enquiry into online

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[9]A. Bruell, 'Inside the Hidden Costs of Programmatic' *AdAge* (14 September 2015) <https://adage.com/article/print-edition/inside-hidden-costs-programmatic/300340/>; S. Gatz, 'Publishers and the Hidden "Ad Tech Tax"' *AdExchanger* (1 April 2016) <https://adexchanger.com/the-sell-sider/publishers-and-the-hidden-ad-tech-tax/>; N. Neumann, 'Ad Tech Transparency and the Question of Market Manipulation' *AdExchanger* (1 May 2017) <https://adexchanger.com/data-driven-thinking/ad-tech-transparency-question-market-manipulation/>; M. Zawadzinski, 'Why a Lack of Transparency is Killing the Potential of Programmatic Buying' (*The Clearcode Blog*) <https://clearcode.cc/blog/programmatic-buying-transparency/>; M. Sweeney, 'Transparency in Ad Tech: The Problems, Fallouts and Solutions' (*The Clearcode Blog*) <https://clearcode.cc/blog/ad-tech-transparency/>; 'Quality, Transparency of Inventory Top Programmatic Buying Fears' *eMarketer* (1 November 2016) <www.emarketer.com/Article/Quality-Transparency-of-Inventory-Top-Programmatic-Buying-Fears/1014663>.

[10]D. Pidgeon, 'Where did the Money Go? Guardian Buys Its Own Ad Inventory' *Mediatel Newsline* (4 October 2016) <https://mediatel.co.uk/newsline/2016/10/04/where-did-the-money-go-guardian-buys-its-own-ad-inventory/>.

[11]See Part III 'Online Advertising and EU Competition Law', *infra* 11 et seq.

[12]Press release of the Autorité de la Concurrence of 6 March 2018, 'Sector-specific Investigation into Online Advertising', available in English at <www.autoritedelaconcurrence.fr/user/standard.php?id_rub=684&id_article=3133&lang=en>; Opinion no. 18-A-03 of 6 March 2018, *supra* note 7.

advertising, "[d]ue to the great economic importance of this sector for advertisers and content providers active on the Internet and in view of discussions about the difficult competitive environment in this market",[13] and released a short paper on the same topic.[14] In the UK, the Select Committee on Communications appointed by the House of Lords noted in its 2018 Report the lack of transparency in digital advertising and advised that the Competition and Markets Authority (CMA) "conduct a market study of digital advertising to investigate whether the market is working fairly for businesses and consumers."[15] On 12 October 2018, the independent Digital Competition Expert Panel launched a public consultation "to conduct an independent review of the state of competition in the digital economy." The questions to which interested parties are invited to respond concern, inter alia, competition in online advertising.[16]

Of these different initiatives, the FCA Opinion is the only one that specifically focuses on display advertising, but it remains at a fairly high level of generality. It has been reported, however, that the French Competition Authority may initiate proceedings against specific undertakings based on the findings of its Opinion,[17] and on 8 November 2018 the Authority announced "the opening of litigation investigations on abusive #data collection and processing as well as access restrictions."[18] Even so, at this stage, there is little information in the public domain regarding the competition issues that may arise in the display advertising sector and we are not aware of any scholarly paper devoted to this subject.

Against this background, the purpose of this paper is to explore the display advertising ecosystem and discuss the competition law issues that may arise in this sector as a result of Google's control of the ad tech value chain. We should at this point offer a word of caution. As the readers will perceive, online display advertising is highly complex as its

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[13]Press release of Bundeskartellamt of 1st January 2018, 'Bundeskartellamt Launches Sector Inquiry into Market Conditions in Online Advertising Sector' <www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2018/01_02_2018_SU_Online_Werbung.html>.

[14]Bundeskartellamt, 'Competition and Consumer Protection in the Digital Economy': Online advertising <www.bundeskartellamt.de/SharedDocs/Publikation/EN/Schriftenreihe_Digitales_III.html?nn=3600108>.

[15]House of Lords, Select Committee on Communications, 1st Report of Session 2017–2019 'UK Advertising in a Digital Age' (11 April 2018) <https://publications.parliament.uk/pa/ld201719/ldselect/ldcomuni/116/116.pdf>.

[16]See <www.gov.uk/government/consultations/digital-competition-expert-panel-call-for-evidence/digital-competition-expert-panel>.

[17]M. Rosemain and G. Barzic, 'France may Probe Google and Facebook Over Online Ad Dominance' Reuters (6 March 2018), <www.reuters.com/article/us-france-advertising-competition/france-may-probe-google-and-facebook-over-online-ad-dominance-idUSKCN1GI15B>.

[18]See <https://twitter.com/Adlc_/status/1060459904417316864>.

mechanics involve multiple electronic processes, including real-time auctions, performed by computers in milliseconds. Thus, the technical parts of this paper represent our best effort to describe these processes in a manner that is accessible to competition law and economics practitioners, while the legal analysis seeks to apply EU competition rules to the ad tech ecosystem. Our competition analysis is tentative at this stage given the limited amount of publicly available information on some of the practices that create competition concerns. Yet the stakes are high considering the critical importance of display advertising for both advertisers and publishers, and it is hoped that the abovementioned initiatives taken by competition authorities will throw some light on a rather opaque sector.

The paper is divided into four parts. Part II describes the display advertising ecosystem with a focus on the technologies and tools comprising the ad tech market. Part III discusses the competition law issues that may arise in the ad tech markets. It first discusses market definitions and shows that Google appears to be dominant in several ad tech markets. It then describes the way in which programmatic display advertising functions in practice, and outlines several Google conducts which may amount to abuse of a dominant position in breach of Article 102 TFEU. Part IV concludes.

## II. The display advertising ecosystem: a complex world with multiple actors

In this Part, we introduce the distinction between search and display advertising (Section A) and discuss the rise of so-called "programmatic advertising", as well as the significant changes it has brought in the online advertising landscape (Section B). Then, we present the various actors that intermediate between advertisers and publishers (Section C).

### A. Introduction to display advertising

As a starting point, it is helpful to distinguish two main forms of online advertising, i.e. *search* advertising and *display* advertising.

*Search* advertising refers to text advertisements displayed above or below the search results of a search engine each time a user enters a search query that matches with a keyword on which advertisers bid. For example, when a user enters a search query in Google (e.g. "cars for rent"), Google will display in its Search Engine Results Pages

(SERPs) in addition to (and usually above) so-called "organic" search results (i.e. natural results that are displayed according to the search engine's algorithm) "paid" search results, i.e. ad links.[19] Search advertising is said to be most successful in terms of "conversion",[20] in that the user entering the search query expresses her interest in a given product or service, and is thus more likely to perform the desired action.

*Display* advertising is closer to traditional offline advertising. Display ads are visual-based advertisements (e.g. texts, images or videos) displayed on the website of a publisher. An example of display advertising is a banner on the top of a newspaper webpage promoting a new car model or a video promoting a new blockbuster. While conversion may be lower than in the case of search advertising, display advertising is said to be more suitable for the purpose of raising "brand awareness" among consumers.

## B. The programmatic revolution

Initially, online display advertising was no more complex than ordinary, offline advertising, e.g. in print media or TV. Publishers wishing to monetize their available ad space (called "ad inventory" or simply "inventory") engaged in direct, bilateral negotiations with advertisers in order to sell ad space at a given price. Such "manual" media buying had several drawbacks. First, it was time-consuming and required a dedicated salesforce to conduct the negotiations. Moreover, publishers faced the "fill" risk, i.e. that they would be left with unsold inventory. Finally, the widespread use of Internet brought with it the emergence of thousands of websites with available ad space, which could not practically be sold directly to advertisers.

The answer to those inefficiencies was provided by technological advances that made it possible for advertisers and publishers to have a completely automated and seamless ad inventory buying/selling process. "Programmatic advertising", as it is known, consists in automated

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[19] Advertisers wishing to have their ads shown in Google's SERPs compete with other advertisers through a real-time auction organized by Google's 'AdWords'.

[20] Conversion is defined as a campaign visitor or recipient performing the desired action. This may be a purchase, filling in a form, downloading a document or a visit behavioural model. Conversion can also be an action carried out offline, such as a phone call or a store visit. The action considered to be a conversion depends on the context of the campaign, the type of activity and the objectives assigned to a target or campaign. The definition is derived from the FCA Opinion, supra note 7 116.

decision-making, where dedicated software and complex algorithms fuelled by various categories of user data (behavioural, demographic, etc.) are used to sell and purchase ad inventory within fragments of a second, avoiding "human" negotiation between publishers and advertisers.[21]

In its most popular form, called programmatic real-time bidding ("RTB"), *each time* a user visits the website of a publisher, advertisers are invited to bid for the available ad space in order to display their advertisement to the particular user (called "ad impression") in a *real-time auction*. The highest bidder wins the ad impression and gets to serve the ad that the user will actually see on the website. Remarkably, the whole process from the moment the user types in his/her browser the URL of the publisher's website until the ad is finally shown lasts only fragments of a second, usually about 300–400 milliseconds.[22]

Initially, programmatic advertising was used to facilitate the sale of "remnant" inventory, i.e. inventory that publishers had not managed to directly sell to advertisers. Publishers would prefer to sell their most expensive, high-yield inventory (called "premium", e.g. the top of the home page of an online newspaper) through direct sales. However, that is no longer the case. Programmatic advertising, once associated with cheap ad inventory of dubious quality, is being increasingly used to sell "premium" inventory. It is reported that by 2019, 67% of global digital ads will be bought programmatically,[23] while according to a report by eMarketer, more than 80% of digital display ads in the US will be bought programmatically in 2018.[24]

Programmatic advertising has brought with it a number of important changes. First, there has been a shift from the *context* (i.e. the content

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[21]For an excellent introduction to the programmatic revolution, see M. Sweeney, 'The Colorful History of Advertising Technology in Just 63 Slides' (*The Clearcode Blog*, 12 May 2015) <https://clearcode.cc/blog/the-colorful-history-of-advertising-technology-in-just-63-slides/>; M. Sweeney, 'How Real-time Bidding (RTB) Changed Online Display Advertising' (*The Clearcode Blog*, 8 January 2015) <https://clearcode.cc/blog/real-time-bidding-online-display-advertising/>; I. Simpson, 'Real-time Bidding (RTB) & Programmatic: One and the Same?' (*The Clearcode Blog*, 13 April 2016) <https://clearcode.cc/blog/difference-between-rtb-programmatic/>; M. Zawadziński, 'Understanding RTB, Programmatic Direct and Private Marketplace' (*The Clearcode Blog*, 13 August 2018) <https://clearcode.cc/blog/rtb-programmatic-direct-pmp/>.

[22]To put this into context, a blink of the eye on average takes about 400 milliseconds.

[23]A. Schiff, 'Zenith: Programmatic Display Will Eat the World By 2019' *AdExchanger* (20 November 2017) <https://adexchanger.com/online-advertising/zenith-programmatic-display-will-eat-world-2019/> (noting that '[t]he main takeaway is that advertisers are spending more on programmatic and that trend is only accelerating').

[24]See <www.emarketer.com/content/more-than-80-of-digital-display-ads-will-be-bought-programmatically-in-2018>. Moreover, new forms of programmatic advertising have emerged, such as *programmatic direct*, which are quite similar to the traditional one-to-one negotiations between publishers and advertisers, but with the assistance of dedicated software optimizing media buying.

of the website) to the *user*. Advertisers place less emphasis on *where* their advertisement will be shown, and instead base their decision according to the specific user that will be exposed to the ad. If the user is within the target group of the campaign set up by the advertiser, the latter will be willing to display its ad even on websites whose content bears no relationship to its product. For example, while luxury watch makers historically sought to associate their ads with certain types of content (e.g. the "how to spend it" page of the Financial Times, which features many luxury items), this is no longer necessarily the case as advertisers are now able to reach tailored audience segments that correspond to their campaign goals regardless of the website they visit.

Second, user data are more valuable than ever. In order to target a particular user, it is crucial that advertisers acquire access to data about *that* user (e.g. behavioural data extracted from browsing history, sociodemographic data such as age and gender or geographical data) to which they may wish to show their ad. The more (and better) user data advertisers have, the higher they are willing to bid for a user within their target group, leading in principle to higher revenues for the publisher. If, on the other hand, advertisers have limited data about the user, they will take a more cautious approach and bid lower (the bid is "blind").

Third, programmatic advertising has given rise to so-called "ad tech" companies, that is operators that use dedicated software to intermediate between the two sides of the chain, i.e. publishers and advertisers, and facilitate the process of ad inventory buying and delivery of ads to the user.[25] The emergence of these multiple actors has at the same time led to unprecedented complexity, even for those "in the know",[26] to the effect that the display advertising ecosystem is often described as opaque and lacking transparency.

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[25]For an explanation of ad tech, see I. Simpson, 'What Exactly Is Ad Tech' (*The Clearcode blog*, 14 December 2016) <https://clearcode.cc/blog/what-is-adtech/>.

[26]An industry commentator notes in a recent article that '[i]f you count the third-party pixels running on any publisher's website, you will immediately see how complicated and convoluted the once simple process of putting an ad on a web page has become', see R. Lala, 'Is It Too Late For Publishers To Take Back Control?' *AdExchanger* (11 July 2018) <https://adexchanger.com/the-sell-sider/is-it-too-late-for-publishers-to-take-back-control/>. See also Bannister, 'Has Sell-side Ad Tech Become too Complex?' *AdExchanger* (16 March 2018) <https://adexchanger.com/the-sell-sider/has-sell-side-ad-tech-become-too-complex/> (noting that '[c]omplexity is here to stay […] The question for many publishers is whether they can navigate this minefield of complexity and find partners that help them simplify things and maximize their revenue at the same time'); I. Simpson, 'Complex Relationships in Digital Advertising' (*The Clearcode Blog*, 14 April 2016) <https://clearcode.cc/blog/digital-advertising-relationships/>.

At its most basic, advertisers are paying for access to ad inventory and publishers are compensated for granting such access. The challenge is to figure out what happens in between them. This is an important question, since it has been suggested that publishers may end up obtaining as little as 30% of what advertisers pay,[27] and there are reasons to believe this may be due to a lack of competition in the ad tech market. Even though the existence of multiple actors could give the impression of a fragmented landscape with dispersed competitors, it has been suggested that Google has managed to hold a stronghold, in that it is virtually the market leader across all the steps of the value chain. But first it is helpful to present the multiple actors and explain their role.

### C. Key actors and products in display advertising

Within the display advertising ecosystem, the traditional actors, i.e. publishers (the sellers of ad inventory) and advertisers (the buyers of ad inventory), are supplemented by a multitude of other parties that facilitate exchanges between them, either by providing intermediation services or by providing the necessary technology tools for the delivery of ads.

The key actors are the following:[28]

- **Publishers** (e.g. online newspapers) serve user content (e.g. news articles) that is monetized by selling ad inventory to advertisers.
- **Advertisers** (e.g. car manufacturers) buy ad inventory on publishers' webpages to promote their brand to targeted users.
- **Publisher Ad Servers** are tools that publishers use to manage their ad inventory. A publisher ad server determines and records how ad inventory is filled each time a user visit the publisher's website.[29] Examples are Google's DoubleClick For Publishers ("DFP"), recently rebranded as "Google Ad Manager" after its integration with AdX (see below),[30] the OpenX ad server and the AdZerk ad server.
- **Advertiser Ad Servers** are tools that advertisers use to manage their ad campaigns. An advertiser ad server performs two primary functions: it (a) stores and delivers the advertisement (called "creative" in ad tech jargon) and (b) helps advertisers monitor and optimize their ad

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[27]See *supra* note 11.
[28]See also the FCA Opinion, 24–35.
[29]For an excellent description of ad servers, see M. Zawadzinski, ' What is an Ad Server and How Does It Work?' (*The Clearcode Blog*) <https://clearcode.cc/blog/what-is-an-ad-server/>.
[30]For the sake of clarity, we retain the original brand names of Google's ad tech tools.

campaign by tracking where ads are served and providing detailed reporting on their performance (e.g. click-through rates, etc.).[31] An example is Google's DoubleClick Campaign Manager, recently rebranded to "Display & Video 360".

- **Supply Side Platforms (SSPs)** organize demand for ad inventory and help the publisher choose the most profitable ad to display.[32] Traditionally, SSPs were used by publishers to connect to ad exchanges to sell their inventory. However, over the years SSPs have evolved, with many now functioning as ad exchanges themselves, allowing publishers to connect directly to DSPs rather than connecting through an ad exchange. For this reason, ad tech specialists often use the terms SSP and ad exchange interchangeably. SSP examples are Google's Ad Exchange ("AdX"), AppNexus, PubMatic and One by AOL.

- **Demand Side Platforms (DSPs)** manage the purchasing of ad inventory for advertisers via a single management interface. DSPs are used by advertisers to connect to an ad exchange/SSP and buy ad inventory.[33] DSPs may also include data processing functionalities to help advertisers find the most effective impressions for their ads. Examples of DSPs are Google's DoubleClick Bid Manager (DBM), DataXu, MediaMath and Amazon DSP.

- **Ad Exchanges** are digital marketplaces for ad inventory where supply and demand meet. Traditionally, publishers supply ad inventory through SSPs and advertisers bid in real-time through DSPs. Examples of ad exchanges are Google's AdX, AppNexus, The Rubicon Project, OpenX and One by AOL. As noted above, SSPs and ad exchanges, while traditionally separate services, are increasingly provided for as integrated solutions, such as in Google's AdX, which has been recently integrated with DFP to form Google Ad Manager.

- **Ad Networks** pool ad inventories from a large number of publishers and then sell them in slices to advertisers.[34] Ad networks can buy and sell directly, buy and sell inventory on ad exchanges, or

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[31] Click-Through Rate ('CTR') is a performance indicator that measures the ratio of the number of clicks logged on a specific advertisement to the number of times it is displayed. This rate gives the percentage of users who view a banner and activate it by clicking on it. The definition is derived from the FCA Opinion 116.

[32] For an excellent description of SSPs, see M. Zawadzinski and M. Wlosik, ' What Is a Supply-side Platform (SSP) and How Does It Work?' (*The Clearcode Blog*, 18 October 2018) <https://clearcode.cc/blog/what-is-supply-side-platform/>.

[33] For an excellent description of DSPs, see M. Sweeney, 'What Is a Demand-Side Platform (DSP) and How Does It Work?' (*The Clearcode Blog*, 10 February 2015) <https://clearcode.cc/blog/demand-side-platform/>.

[34] For an excellent explanation of ad networks, see M. Zawadzinski, 'What Is an Ad Network and How Does It Work?' (*The Clearcode Blog*) <https://clearcode.cc/blog/what-is-an-ad-network-and-how-does-it-work/>.

some combination of both. An example is Google's "AdSense," which allows small publishers ("partner sites") to sell ads to Google demand sources. AdSense is accessed through AdWords, a programme that enables advertisers to create ads, which will appear on relevant Google search results pages and Google's network of partner sites. Google partner sites form the Google Display Network (GDN), which comprises more than two million websites and is said to cover over 90% of people active on the Internet.[35]

- **Data Management Platforms (DMPs) and data providers** are responsible for collecting, storing, organizing and analysing massive amounts of data collected from various sources (first-party and third-party data) creating unique user profiles, often across different devices. Examples of DMPs are BlueKai (Oracle), Weborama and Adobe Audience Manager. DMPs are usually linked to a DSP to help advertisers target their audience.[36] Examples of data providers include comScore and IAS.

Publishers have thus at their disposal two ways to sell their inventory to advertisers: either *directly* or *indirectly* through the use of intermediaries such as SSPs, DSPs and ad exchanges. However, even if publishers and advertisers engage in direct deals, they still need ad serving technology tools to manage their ad inventory and ad campaign respectively, i.e. publisher ad servers and advertiser ad servers.

## III. Online advertising and EU competition law

Now that the reader is familiar with the actors in the display advertising ecosystem, it is possible to explore and flag up some key competition law issues arising in this sector. We first look at market definition and dominance (Section A). We find that there are reasons to believe that the ad tech markets as currently defined by competition authorities stay at too high a level of generality and should be disaggregated into more precisely defined markets. We also find that evidence suggests that Google may be dominant on some ad tech markets. We then identify several Google conducts, which

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[35]See <https://support.google.com/google-ads/answer/2404191?hl=en>.
[36]For an excellent description of DMPs, see M. Zawadzinski, 'What is a Data Management Platform (DMP) and How Does it Work?' (*The Clearcode Blog*) <https://clearcode.cc/blog/data-management-platforms/>.

may produce exploitative and exclusionary effects in breach of Article 102 TFEU (Section B).

## A. Market definition and dominance

While the past decisional practice of the European Commission in merger control cases and the FCA Opinion provide useful guidance, there are still many open questions when it comes to market definition and dominance.

### 1. Market definition

Market definition is a factually-intensive inquiry and there is a dearth of publicly available data to assess the substitutability between certain online display advertising products and services. Despite this informational constraint, this section defines relevant markets based on precedents and commentary in the specialized press.

*a. Online advertising as a separate product market.* A first question is whether online advertising is a distinct product market or whether it is effectively constrained by offline advertising, especially TV advertising. The matter is settled since the European Commission has repeatedly held that online advertising does not belong to the same relevant market as offline advertising, mainly relying on the enhanced specificity of online advertising, i.e. its advanced targeting possibilities, and the different pricing mechanisms used.[37] The French Competition Authority upheld this distinction in its 2018 Opinion.[38]

*b. Search vs display advertising.* The next question is whether the market for online advertising should be sub-segmented between *search* and *non-search* (i.e. display) advertising. Such distinction was considered by the European Commission in *Google/DoubleClick*,[39] but the issue was ultimately left open. The same approach was adopted in subsequent merger

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[37]Decision of 11 March 2008, COMP/M.4731 *Google/DoubleClick*, para 45, 46 and 51; Decision of 18 February 2010, COMP/M.5727 *Microsoft/Yahoo! Search Business*, para 61; Decision of 9 September 2014, COMP/M.7288 *Viacom/Channel 5 Broadcasting*, para 36, 38 and 40; Decision of 30 October 2014, COMP/M.7217 *Facebook/WhatsApp*, para 75 and 79, Decision of 13 May 2016, COMP/M.7987 *Towerbrook Capital Partners/Infopro Digital*, para 10; Decision of 6 December 2016, COMP/M. 8124 *Microsoft/LinkedIn* para 159; Decision of 21 December 2016, COMP/M.8180 *Verizon/Yahoo*, para 25.
[38]FCA Opinion, para 174.
[39]Decision of 11 March 2008, COMP/M.4731 *Google/DoubleClick*, para 56.

control decisions.[40] In its 2010 opinion focusing on *search* advertising, the French Competition Authority adopted a clear distinction between search and display advertising, citing the disparity in the number of users of display and search advertising and the difference in capabilities of the two advertising types stemming from the limited text nature of search ads.[41] The same view was expressed in its 2018 opinion.[42] On the other side of the Atlantic, the Federal Trade Commission (FTC) observed in the *Google/DoubleClick* merger that search and display advertising were not substitutes for each other.[43]

*c. Ad intermediation.* As noted above, advertisers may purchase ad inventory either through the channel of *direct* sales or through that of *intermediated* sales. In *Google/DoubleClick,* the European Commission considered that

> a separate market for intermediation in online advertising can be defined in view of the fact that there is no substitute for the service provided by intermediaries for the sale of smaller publishers' inventory and for the sale of (at least) part of the remnant inventory of larger publishers that also use the direct sales channel.[44]

The Commission seems to have included ad networks and ad exchanges within the market for ad intermediation.[45] Further subdivision between ad intermediation in search ads and ad intermediation in non-search (display) ads was considered but left open.[46] The Commission maintained this approach in subsequent merger decisions.[47]

The 2007 FTC decision in the *Google/DoubleClick* merger similarly distinguished between advertisements directly sold by publishers and

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[40]Decision of 18 February 2010, COMP/M.5727 *Microsoft/Yahoo! Search Business*, para 75; Decision of 18 February 2010, COMP/M.5727 *Microsoft/Yahoo! Search Business*, para 75; Decision of 4 September 2012, COMP/M.6314, *Telefonica UK/Vodafone UK/Everything Everywhere/JV*, para 151; Decision of 4 September 2012, COMP/M.6314, *Telefonica UK/Vodafone UK/Everything Everywhere/JV*, para 151; Decision of 30 October 2014, COMP/M.7217, *Facebook/WhatsApp*, para 76; Decision of 6 December 2016, COMP/M.8124 *Microsoft/LinkedIn* para 161; Decision of 21 December 2016, COMP/M.8180 *Verizon/Yahoo*, para 25.

[41]Autorité de la Concurrence, 2010 No 10-A-29 Opinion, 28: 'display is reserved for branding objectives and search-based ads for performance objectives'.

[42]FCA Opinion, para 179.

[43]'Statement of Federal Trade Commission concerning Google/DoubleClick', FTC File No. 071-0170, 3: '[T]he evidence shows that the sale of search advertising does not operate as a significant constraint on the prices or quality of other online advertising sold directly or indirectly by publishers or vice versa.'

[44]Decision of 11 March 2008 COMP/M.4731 *Google/DoubleClick*, para 68.

[45]Id. para 61, where it is stated that 'the overwhelming majority of Google's competitors (that is to say <u>ad networks and ad exchanges</u>)' (emphasis added).

[46]Id. para 70–73.

[47]Decision of 18 February 2010, COMP/M.5727 *Microsoft/Yahoo! Search Business*, para 82; Decision of 11 October 2013, COMP/M.6967 *BNP Paribas Fortis/Belgacom/Belgium Wallet*, para 64; Decision of 4 September 2012, COMP/M.6314, *Telefonica UK/Vodafone UK/Everything Everywhere/JV*, para 175.

advertisements sold through intermediaries, noting that publishers are able to charge higher prices for direct sold inventory than inventory sold through intermediaries.[48] The FTC held that the market for ad intermediation services includes ad exchanges and ad networks.[49]

*d. Ad server technology services.* In *Google/DoubleClick*, the Commission defined a separate market for the provision of online display ad serving (i.e. services provided by ad servers) and believed that this market could be further distinguished depending on whether such ad services are rendered to publishers or advertisers.[50] The French Competition Authority upheld the distinction between ad intermediation and ad serving in a 2010 decision.[51] In its 2018 opinion it noted that there is indeed "some convergence between ad servers and technical intermediation services (DSPs, SSPs, ad exchanges etc.)",[52] but it observed that "a similar observation was made in 2008 [in *Google/DoubleClick*] by the Commission",[53] concluding that "[n]o information emerged from the consultation […] would call into question the conclusions of the Commission's analysis".[54]

The above analyses are helpful, especially in that they distinguish between the market for ad serving technology and ad intermediation. However, these analyses have up until now stayed at a high level of generality and, in our opinion, do not fully reflect the diversity of products and services comprising the programmatic advertising ecosystem. Further market sub-segmentation is thus desirable.

For example, it is doubtful that DSPs belong to the same market as ad exchanges/SSPs. DSPs form a distinct market since they do not compete with ad exchanges, but they participate in the auctions organized by these exchanges/SSPs. Moreover, it seems appropriate to segment the market for ad serving technology between ad servers for publishers and

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[48]Statement of Federal Trade Commission concerning *Google/DoubleClick*, FTC File No. 071-0170, 4: 'The evidence shows that ad intermediation is not a substitute for publishers and advertisers who place display ads into directly acquired ad inventory or vice versa. … Likewise, from the advertisers' perspective, ads served by intermediaries are not substitutes for directly placed ads.'

[49]Id. 5: 'There are two types of ad intermediation products: ad networks and ad exchanges. Ad networks and ad exchanges are alike in that they both aggregate advertising inventory. Ad networks are intermediaries that aggregate or purchase advertising inventory from a group of websites and sell this inventory to advertisers or ad agencies, taking a share of the revenue from each sale. Ad exchanges differ in that they aggregate inventory by providing platforms for advertisers and publishers to list and bid for inventory. The evidence shows that the market in which ad networks and ad exchanges compete is relatively nascent, dynamic, and highly fragmented.'

[50]Decision COMP/M.4731, *Google/DoubleClick*, para 74–81.

[51]Autorité de la Concurrence, decision no. 10-DCC-152 of 3 November 2010, Axel Springer AG/Se Loger, at para 23–24.

[52]FCA Opinion, para 185.

[53]Ibid.

[54]Ibid.

ad servers for advertisers. Ad servers for publishers fulfil substantially different needs than ad servers for advertisers and are targeted to different customer groups.[55] It would seem unlikely that in the case of a price increase e.g. of ad servers for advertisers, advertisers would switch to an ad server which is designed for publishers. It is telling that Google itself presents its technology solutions for publishers (DFP) and advertisers (DCM) as distinct products, as the French Competition Authority observed in its 2018 Opinion.[56]

In sum, we believe that the ad tech sector comprises at least the following markets: (i) a market for intermediation in online advertising (comprising ad exchanges and ad networks); and (ii) a market for ad serving technologies, which should be further segmented between ad servers for publishers and ad servers for advertisers. This does not exclude that further markets may have to be defined to account for additional ad tech products.

### 2. Dominance

It is settled case-law that the concept of dominance found in Article 102 TFEU refers to

> a position of economic strength enjoyed by an undertaking, which enables it to prevent effective competition being maintained on a relevant market, by affording it the power to behave to an appreciable extent independently of its competitors, its customers and ultimately of consumers.[57]

In examining whether a particular undertaking holds a dominant position on a relevant market, regard is had to the market share of the undertaking and its competitors, as well as to "other factors", namely whether there are barriers to entry or expansion that hinder new competitors from entering the market or existing market players from expanding.[58] Thus, as in the

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[55]'Why Do Publishers and Marketers have Separate Ad Servers?' (*Ad Ops Insider*, 23 February 2010) <www.adopsinsider.com/ad-ops-basics/why-do-publishers-and-marketers-have-separate-ad-servers/>.
[56]FCA Opinion, para 181.
[57]Case 27/76 *United Brands Company and United Brands Continentaal v Commission* (1978) ECR 207, para 65; Case 85/76 *Hoffman-La Roche & Co. v Commission* (1979) ECR 461, para 38.
[58]In its Guidance Paper on Article 102 TFEU, the Commission notes that "[t]he assessment of dominance will take into account the competitive structure of the market, and in particular the following factors: constraints imposed by the existing supplies from, and the position on the market of, actual competitors (the market position of the dominant undertaking and its competitors), constraints imposed by the credible threat of future expansion by actual competitors or entry by potential competitors (expansion and entry), constraints imposed by the bargaining strength of the undertaking's customers (countervailing buyer power)." See Communication from the Commission – Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (Text with EEA relevance) (2009/C 45/02) para 12.

case of market definition, the assessment of dominance is a fact-intensive exercise.

It is often suggested that Google has a strong grip on the display advertising ecosystem. For example, a 2015 *Forbes* article refers to a DFP crash affecting more than 55.000 websites as "a stark reminder of how an established player like Google has quietly achieved dominance over the so-called 'ad tech' industry".[59] The author notes that Google "is now the largest and/or dominant player" in each ad tech market (including SSPs, DSPs and ad servers).[60] In its 2018 Opinion, the French Competition Authority observes that in the ad intermediation and ad serving sectors, Google "has held a leading position since its acquisition of DoubleClick in 2008".[61]

In fact, DoubleClick marked only the beginning of a series of acquisitions, through which Google managed to become present in virtually every segment across the value chain between publishers and advertisers. In 2010, Google expanded by acquiring AdMob, the leading ad network for mobile.[62] The same year Google bought leading DSP Invite Media[63] and in 2011 it acquired leading SSP AdMeld,[64] which it then integrated to AdX.[65] Google thus now offers the leading ad server for publishers (DFP), an ad server solution for advertisers (DoubleClick Campaign Manager), an ad network (AdSense which is part of the Google Display Network and is accessed by advertisers through AdWords), the leading ad exchange/SSP (AdX), the leading DSP (DoubleClick Bid Manager), as well as its own powerful data management platform (Google Analytics).

The French Competition Authority paid particular attention to Google's acquisitions in its 2018 Opinion, observing that "[t]hese acquisitions generally counteract the limited barriers to entry and expansion

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[59]A. Grunes, 'Google's Quiet Dominance Over the "Ad Tech" Industry' *Forbes* (26 February 2015) <www.forbes.com/sites/realspin/2015/02/26/googles-quiet-dominance-over-the-ad-tech-industry/#1448aaca5b78>.

[60]Ibid.

[61]FCA Opinion, para 218.

[62]D. Frommer, 'Google Buys AdMob For $750 Million in Stock' *Business Insider* (9 November 2009) <www.businessinsider.com/google-to-acquire-mobile-ad-network-admob-for-750-million-in-stock-2009-11?IR=T>.

[63]E. Schonfeld, 'Google Confirms Invite Media Acquisition, Brings Bidding To Display Ads' *Techcrunch* (3 June 2010) <https://techcrunch.com/2010/06/03/google-confirms-invite-media/?guccounter=1>. Google then rebranded Invite Media to DoubleClick Bid Manager.

[64]M. Learmonth, 'Google Acquires Ad-optimization Firm AdMeld For $400 Million' *AdAge* (9 June 2011) <https://adage.com/article/digital/google-acquires-ad-optimization-firm-admeld-400-million/228108/>.

[65]See <www.admeld.com/>.

as they prevent new players from reaching a significant size and being able to compete with the positions of established stakeholders".[66]

The presence of Google across the value chain also means that it may have a unique data advantage.[67] In its 2018 Opinion, the French Competition Authority observes many players pointed out that Google:

> only let[s] advertisers who buy ad space via their buying platforms mine data generated from the services they publish. This means that Google combines supplying its data and providing intermediation services and ad servers for advertisers (AdWords, the DCM ad server and the DBM DSP), which would seem to give it an advantage over its competitors. Advertisers can define audience segments based on several types of data that only Google is able to collect. This includes user data, Google's first-party data from the use of Google services, data on websites and third-party inventories that Google sells through the Google Display Network, AdWords and DoubleClick AdX, and data from third-party websites and applications that use DoubleClick and share data with Google.[68]

Finally, the French Competition Authority found that Google has an additional competitive edge, in that it "is one of the rare companies to offer both display and search advertising services to advertisers".[69] That "enables it to offer dual-channel data analytics services".[70]

Now, when one takes a more granular approach based on the ad tech markets identified in Section A above, publicly-available evidence suggests that Google may have a dominant position on some of these markets. For example, the French Competition Authority in its 2018 Opinion observes that "Google's DSP, DBM [DoubleClick Bid Manager], appears to be the DSP that generates the largest revenue, and which has significant growth. [...] no DSP has currently reached this level of revenue on a global level, including AppNexus and Mediamath."[71]

Moreover, many commentators and industry participants consider that DFP is the dominant ad server for publishers. A 2016 article published in *The Drum* observes that "Google's DoubleClick for Publishers is by far the

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[66]FCA Opinion, para 239. See also para 105, noting that '[s]ince the early 2000s, Google has acquired around 200 companies'.

[67]See M. Ingram, 'How Google and Facebook Have Taken Over the Digital Ad Industry' *Fortune* (4 January 2017) <http://fortune.com/2017/01/04/google-facebook-ad-industry/> (noting that '[d]ata on users and their preferences and behavior is the Holy Grail for most advertisers, and the reality is that Google and Facebook have orders of magnitude more data than their nearest competitors.').

[68]FCA Opinion para 143 (emphasis added).

[69]Id. para 144.

[70]Id. para 147.

[71]FCA Opinion, para 221.

most dominant one [ad server for publishers] the market".[72] A 2018 article in *MediaPost* states that DoubleClick is "by far the dominant ad server used by advertisers, agencies and digital publishers",[73] while according to Datanyze report cited in the FCA Opinion, Google has a market share of more than 70% of the ad servers in France.[74]

Google's position in the ad server market seems also protected by various factors. First, there is the presence of switching costs. An industry commentator notes that

> [a]s a publisher, replacing your primary ad server is not a trivial task. Think of it like doing a mid-flight engine swap on an airplane. Except that it's your revenue engine. It's hard to imagine many publishers wanting to take such a risk.[75]

Moreover, given that DFP is offered to publishers virtually for free,[76] competitors may find it harder to attract DFP customers since they cannot compete on price by undercutting DFP's fees. Finally, given the close connection (in fact today, full integration) between DFP and AdX, some customers may be concerned that leaving DFP may affect their revenues from AdX.[77]

Finally, Google's AdX seems to dominate the ad exchange market. According to market data published by Datanyze, Google's Ad Exchange has in November 2018 a market share of 62.65%, far ahead of the next competitor, AppNexus, with a market share of 13.44%.[78]

## B. Google's possible abusive conducts in ad tech markets

As noted above, the mechanics of display advertising are complex as they involve multiple electronic processes, including real-time auctions, performed in milliseconds by computers. In this context, we first present a technical discussion of such processes, based on extensive research on online sources and conversations with experts (Sub-section 1). Based on

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[72]R. Shields, 'Header Bidding Versus Google First Look' *The Drum* (22 August 2016) <www.thedrum.com/news/2016/08/22/header-bidding-versus-google-first-look>.

[73]J. Mandese, 'Google Discloses Results of "Exchange Bidding," Boosts Publisher Yield >40%' *MediaPost* (16 February 2018) <www.mediapost.com/publications/article/314702/google-discloses-results-of-exchange-bidding-bo.html>.

[74]FCA Opinion, para 223.

[75]R. Vidakovic, 'The Beginner's Guide to Header Bidding' *AdProfs* <https://adprofs.co/beginners-guide-to-header-bidding/>.

[76]DFP comes into two versions: DFP Small Business which is free and DFP Premium which is used by publishers generating significant traffic (more than 90 million impressions per month). Even in the case of DFP Premium the ad serving fees are considered very low.

[77]For an explanation of how that could happen, see *infra* page 26.

[78]See <www.datanyze.com/market-share/ad-exchanges> accessed 25 November 2018.

this technical discussion, we then identify Google's practices that may give rise to competition concerns (Sub-section 2).

### 1. How does programmatic display advertising work in practice?

In this sub-section, we discuss the mechanics of the real-time auctions that determine the advertiser that will get to display its ad to the user each time the latter visits a website.[79] For ease of exposition – but also because it is often the case in real world given DFP's prominence – our example involves a publisher's website using DFP, as it *currently* functions and assuming that the publisher has enabled a recent DFP feature called "Exchange Bidding."[80] We further assume that the publisher's website is part of the popular Google Display Network ("GDN") which is accessible to advertisers through AdWords.[81]

When a user visits the website, the user's browser calls DFP which has an ad arbitration mechanism to determine which ad will be served.[82] As part of that mechanism, DFP first examines whether any *directly* sold ad is eligible to serve. If there is no eligible directly sold ad,[83] DFP invites Google's AdX as well as any connected third-party ad exchanges to submit a bid for the ad impression.[84] Google's AdX will in turn run its own auction, inviting participating DSPs/ad networks to submit a bid.[85] Each DSP/ad network will in turn run its own auction, inviting advertisers to submit a bid. In other words, DFP initiates a series of sequential auctions: in the first auction, advertisers compete with each other within a specific DSP/ad network, e.g. AdWords; in the second auction, DSPs compete with each other within a specific exchange, e.g. Google's AdX; and in the third auction, AdX competes with connected third-party ad exchanges within DFP.

### a. The first auction (AdWords). As soon as DFP initiates the above procedure, AdWords passes on information about the user to advertisers that

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[79]The reader is referred to the Annex for a step-by-step description of ad selection and delivery, from the moment a user types in its browser the URL of the publisher's website until the winning ad is finally displayed.

[80]On Exchange Bidding, see *infra* 27.

[81]<https://support.google.com/google-ads/answer/2472739?hl=en&ref_topic=3121944>.

[82]See Google's ad selection white paper <https://support.google.com/admanager/answer/1143651?hl=en>.

[83]In fact, DFP offers AdX (and connected third-party exchanges in the case of Exchange Bidding) the chance to win the impression *even if* a directly sold ad is eligible to serve, provided its delivery goal is not compromised. This possibility – introduced as a DFP feature called Enhanced Dynamic Allocation – is explained in more detail in the Annex. See also <https://support.google.com/admanager/answer/3721872?hl=en>.

[84]It is important to note that DFP calls competing ad exchanges to submit a bid *only* if the publisher has enabled Exchange Bidding, on which see *infra* 27.

[85]See <https://support.google.com/admanager/answer/152039?hl=en>.

have an AdWords account and invites them to submit their bids to win the ad impression.[86] Advertisers use the information received to calculate how much they will bid – if they bid at all – and return their bids, expressed on a Cost-Per-Click (CPC) basis (e.g. the advertiser bids to pay 4 € for each time the user clicks on its ad). AdWords then selects the highest bid, which wins the auction. However, the advertiser does <u>not</u> pay what it has actually bid. Instead, the advertiser pays only what is needed to rank immediately above the second-highest bidder, which is usually 1 cent more. For that reason, the auction is called a "second-price auction".[87] An example can help illustrate this type of auction. If advertiser A bids 3 € CPC, advertiser B bids 4 € CPC and advertiser C bids 2 € CPC, the winning advertiser B will pay 3.01 € CPC.

*b. The second auction (AdX).* The AdWords auction is over, but that does not necessarily mean that advertiser B will get to serve its ad on the page visited by the user. The reason is that AdWords is not the only platform connected to AdX. There are other ad networks/DSPs connected to AdX, which, just like AdWords, invite advertisers that have an account with them and run their own auctions (typically second-price) and come up with their highest bid. These ad networks/DSPs will now compete with AdWords for the ad impression in a *new* auction, organized by Google's AdX. Publishers should normally benefit from such competition, since it is possible that a competing ad network/DSP might offer a higher bid than AdWords. In this auction, bids are expressed on a different basis, namely on a Cost-Per-Mille ("CPM") basis (i.e. the price paid for every thousand impressions of the same ad, hence the name). This auction is *again* second-price. For example, if DSP1 bids 10 € CPM, DSP2 bids 11 € CPM and AdWords bids 12 € CPM, the winner, AdWords, gets to pay 11.01 € CPM, i.e. slightly more than the second-highest bidder. The second auction hosted by AdX is over.

*c. The third auction (DFP with exchange bidding enabled).* Just like Google's AdX runs the above auction, so do third-party ad exchanges that the publisher has connected with AdX by enabling Exchange Bidding. These third-party exchanges compete with AdX in a unified auction organized by DFP. The publisher should in theory benefit from competition between various ad exchanges, since in a particular case one

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[86]See <https://support.google.com/google-ads/answer/2996564?hl=en>.
[87]For an excellent description of second-price auctions, see M. Zawadzinski, 'How Do First-price and Second-price Auctions Work in Online Advertising?' (*The Clearcode Blog*) <https://clearcode.cc/blog/first-price-second-price-auction/>.

exchange (say, OpenX) may return a higher bid than the others and thus maximize revenue. In contrast to the previous auctions, this auction is a *first-price* auction, i.e. the publisher is paid what the highest bidder bids.

The following graph graphically illustrates the successive auctions described above.[88]
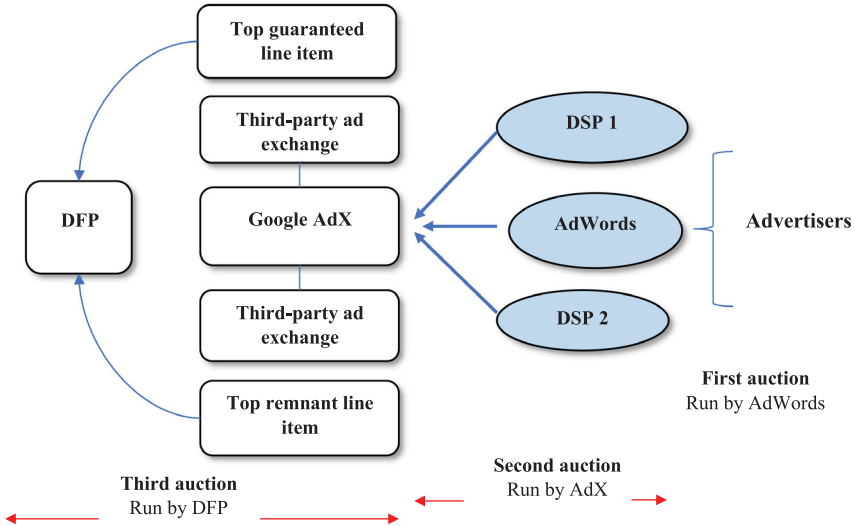


As we discuss hereafter, publishers have generally been uneased with this third auction, concerned that Google might attempt to favour its own ad exchange vis-à-vis competing ad exchanges in a way that harms their revenues. In order to understand such concerns, one needs to first explore the evolution of this third auction process. As we will see, the DFP ad selection mechanism has undergone significant changes.

*Waterfalls.* Under the so-called waterfall system, publishers using DFP could connect the latter with several exchanges, so that they would avoid any risk of relying on only one exchange and ending up with unsold inventory (as one ad exchange might not value the impression and not bid). However, the various exchanges *would not* compete with each other. Instead, they would be ranked according to their *average historical yield* (i.e. how much money they had made on average for the

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[88]The reader is referred to the Annex for an explanation of line items in DFP. Essentially, a *guaranteed* line item represents a directly sold ad, i.e. an ad whose delivery the publisher has promised to an advertiser at a given rate or within a certain time period. AdX may nevertheless 'beat' the guaranteed line item in a particular case and get to serve the ad if it solicits a sufficiently high bid. In the case of *remnant* line items, on the other hand, the publisher has not promised the delivery of the ad.

publisher in the past) in a waterfall-like sequence.[89] Each time an ad impression was available, DFP would give priority to directly sold ads.[90] Once there were no more eligible directly sold ads, a bid request for the ad impression would be sent to the exchange ranked *first* in the waterfall:

- If the first exchange bought the ad impression, the exchanges lower in the waterfall *would not* be invited to bid and the ad selection would be completed.
- If the first exchange did not buy the ad impression, the latter would be offered for sale to the exchange immediately below in the waterfall at a *lower* price. That procedure would continue until the ad impression would be finally sold to an exchange. The "deeper" the ad impression would cascade into the waterfall, the lower the price at which it was offered for sale.
- If no one expressed interest in buying the ad impression, the "fallback" option for the publisher would be to fill the ad space with an ad promoting its own business (so called "in-house" ad).

The following graph illustrates the waterfall setup.
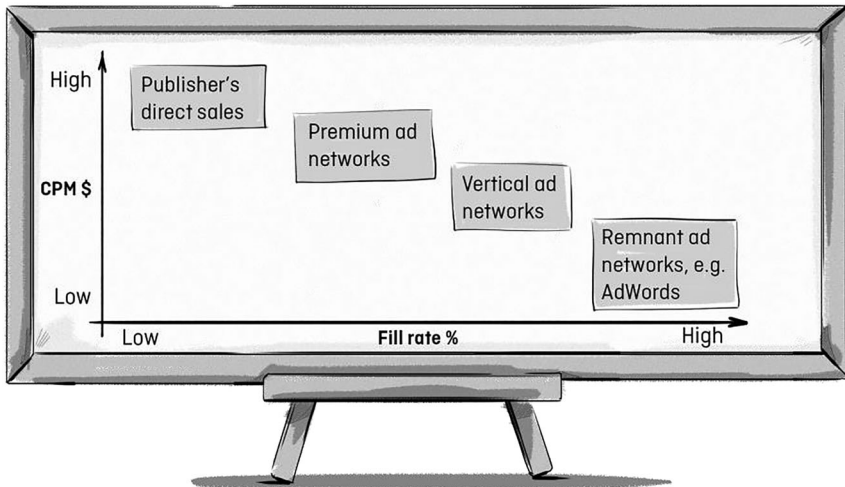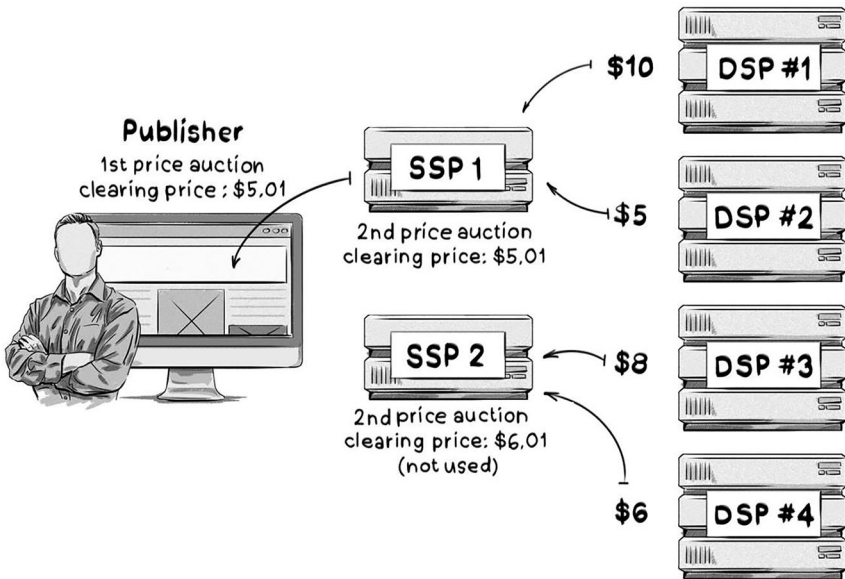


(source: The Clearcode Blog)

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[89]For an excellent description of the waterfall process, see M. Zawadzinski, 'What is Waterfalling and How Does It Work?' (*The Clearcode Blog*, 1 September 2016) <https://clearcode.cc/blog/what-is-waterfalling/>; P. Bannister, 'As Header Bidding Rises, It's More Important Than Ever to Understand The Waterfall' *AdExchanger* (10 February 2016) <https://adexchanger.com/the-sell-sider/as-header-bidding-rises-its-more-important-than-ever-to-understand-the-waterfall/>. Publishers would set the waterfall within DFP by setting *remnant* line items for the various ad exchanges and assigning them an *estimated* bid based on their average historical yield. It is important to note that this does not include any connection between such exchanges and AdX. Such connection takes place only in Exchange Bidding and only if the competing exchange has accepted to connect to AdX.
[90]Directly sold ads were thus typically illustrated as being on the top of the waterfall.

The waterfall setup described above helped publishers to reduce the risk that ad inventory would be left unsold. However, it presented a significant drawback. The sequential setup, where ad exchanges are ranked in priority according to their past performance, prevents them from competing with each other in real-time. As a result, publishers do not optimize revenues in circumstances where an exchange *lower* down the waterfall was willing to bid more for the particular ad impression, but never had the opportunity to do so due to its waterfall ranking.

Assume, for instance, that an ad impression is offered for sale to the ad exchange ranked first in the waterfall at a price of 5 € CPM. The ad exchange runs its own auction and submits a bid of 5.01 € CPM. The impression is sold to the first ad exchange. However, it is possible that an ad exchange lower down the waterfall was willing to submit for the particular ad impression a *higher* bid, e.g. 6.01 € CPM. Even so, it never gets to bid and compete in real-time with the exchange ranked first. The publisher thus misses an opportunity to gain an extra 1 € CPM.

The following graph illustrates the above example:



(Source: The Clearcode Blog)

*Dynamic allocation.* In 2014, Google launched a feature in DFP called *dynamic allocation,*[91] which enabled AdX to act in a "dynamic" manner and disregard the waterfall. As described above, publishers using DFP would assign each ad exchange an *estimated* CPM price based on historical data, thus ranking ad exchanges in a waterfall, according to which they would be called to bid if an impression was available. However, after the introduction of dynamic allocation, when an ad impression was available, DFP would select the highest *estimated* CPM price of an ad exchange in the waterfall and then send that *estimated* price to Google's AdX. AdX would then run a real-time auction to see if it could offer a slightly higher price, e.g. 1 cent more.[92] If it could, then AdX would get to serve the ad.

Therefore, dynamic allocation granted AdX two distinct advantages over other ad exchanges:

(a) First, AdX could run a real-time auction for each ad impression, while other ad exchanges were "stuck" with their estimated prices, never getting the chance to submit a real-time bid (the "real-time-demand" advantage). That means that DFP sheltered AdX from real-time competition from other exchanges, which could thus allow AdX to buy impressions at artificially low prices.

(b) Second, AdX would use the highest estimated price of the ad exchange at the top of the waterfall as the price floor for its *own* auction. That means that in practice AdX could always beat any exchange in the waterfall, provided it could submit a slightly higher bid. AdX had always the "last look" on the ad impression, and that is the reason why industry commentators referred to this advantage as the "last-look" advantage.[93]

An industry commentator summarizes the concerns caused by dynamic allocation as follows:

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[91]See <https://support.google.com/admanager/answer/3721872?hl=en&ref_topic=7506292>. With the later introduction of *enhanced* dynamic allocation, DFP gave AdX the additional ability to be 'dynamic' and insert its real-time demand to outbid even directly sold ads, called guaranteed line items. See *supra* note 85.

[92]G. Sloane, 'WTF is Dynamic Allocation?' *Digiday* (14 April 2016) <https://digiday.com/media/wtf-dynamic-allocation-google-ad-auctions/>; noting that according to Alex Magnin, CRO of Thought Catalog, a new media publisher 'Dynamic allocation allowed Google's exchange to cherry-pick the best ad impressions as they came through the Google-owned ad server, DFP'. See also P. Dinodia, 'Everything You Need to Know About Dynamic Allocation' (*adpushup_blog*, 17 November 2017) <www.adpushup.com/blog/everything-you-need-to-know-about-dfp-dynamic-allocation/>; S. Sluis, 'The End Of Header Bidding? Google Opens Up Dynamic Allocation to Outside Demand' (*AdExchanger*, 13 April 2016) <https://adexchanger.com/platforms/the-end-of-header-bidding-google-opens-up-dynamic-allocation-to-outside-demand/>.

[93]S. Sluis, 'Google Removes Its "Last-look" Auction Advantage' *AdExchanger* (31 March 2017) <https://adexchanger.com/platforms/google-removes-last-look-auction-advantage/>.

Google made the display landscape less competitive by launching Dynamic Allocation in 2014, which enabled its exchange AdX to insert a real-time bid into DFP for every impression. Thus AdX could enter accurate pricing while other partners were stuck with their average tags, even though their bidders could potentially cite a higher price. Theoretically, Dynamic Allocation could enable AdX bidders to pay less for impressions than other partners would be willing to, therefore starving the publisher of revenue. This seemingly unfair setup spurred the adoption of header bidding.[94]

Conversely, if a publisher does not use DFP as its ad server, AdX has none of the above advantages and it will be simply assigned an *estimated* bid, which could be far lower than the real-time bid AdX can produce, given its strength. Thus, publishers may face a catch 22, which helps explain their reluctance to switch to a competing ad server mentioned above:[95] either stick to DFP, where AdX does not face real-time competition from other exchanges, or switch to another server and lose AdX's real-time demand.

*Header bidding.* Publishers were thus concerned that they did not monetize their ad inventory to the full extent, since there could be other exchanges willing to bid more but not offered the chance to do so. In an effort to work around Google's AdX advantage in the waterfall setup, publishers turned to a mechanism called *header bidding*.[96]

Header bidding is just another form of auction. There are, however, key differences between header bidding and the third auction run by DFP.

- First, header bidding takes place *before* the user's browser asks DFP to serve the ad (hence it is also called a *pre-auction*).
- Second, the auction is run by the browser of the user, not DFP. It is the browser, not DFP, that acts as the auctioneer, inviting interested parties to bid for the ad impression. This type of header bidding is called "client-side" header bidding.
- Third, and most importantly, the browser invites demand partners (e.g. ad exchanges/SSPs) to submit bids for the ad impression *simultaneously* in a *unified* auction. There is no waterfall, i.e. demand partners are not prioritized.

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[94]G. Dunaway, 'Rethinking the Ad Server' *AdMonsters* (23 August 2016) <www.admonsters.com/rethinking-ad-server/>.
[95]See *supra* 18.
[96]For an excellent description of header bidding, see Maciej Zawadziński, 'What is Header Bidding and How Does it Work?' (*The Clearcode Blog*, 2 August 2016) <https://clearcode.cc/blog/what-is-header-bidding/>; M. Zawadzinski, 'What's the Difference Between Waterfall Auctions & Header Bidding?' (*The Clearcode Blog*, 22 September 2016) <https://clearcode.cc/blog/difference-waterfall-header-bidding/>; Ratko Vidakovic, 'The Beginner's Guide To Header Bidding' *AdProfs* (30 March 2017) <https://adprofs.co/beginners-guide-to-header-bidding/>;

Once the header bidding auction has revealed the winning bid, it is then sent to DFP (where it is matched with a remnant line item) where AdX may *still* offer a higher bid and win the impression within the context of dynamic allocation.

Although Ad Exchange still had the "last look" and could outbid the winning bid from the header bidding auction, header bidding nevertheless allowed publishers to have access to real-time demand from various ad exchanges and thus get an accurate insight of their inventory's value.[97] AdX could no longer rely on the *estimated* bid from other exchanges (which could be much lower than the actual, real-time bid) to win the auction. Header bidding thus exposed AdX to some degree of competition from other exchanges in that it undermined AdX "real-time-advantage". Header bidding also presented benefits for buyers since they could bid for *every* ad impression – even premium inventory – and not only for the impression that had "cascaded" down the waterfall.[98]

The benefit of having demand partners competing simultaneously is illustrated in the following graph comparing header bidding with traditional waterfall setup.
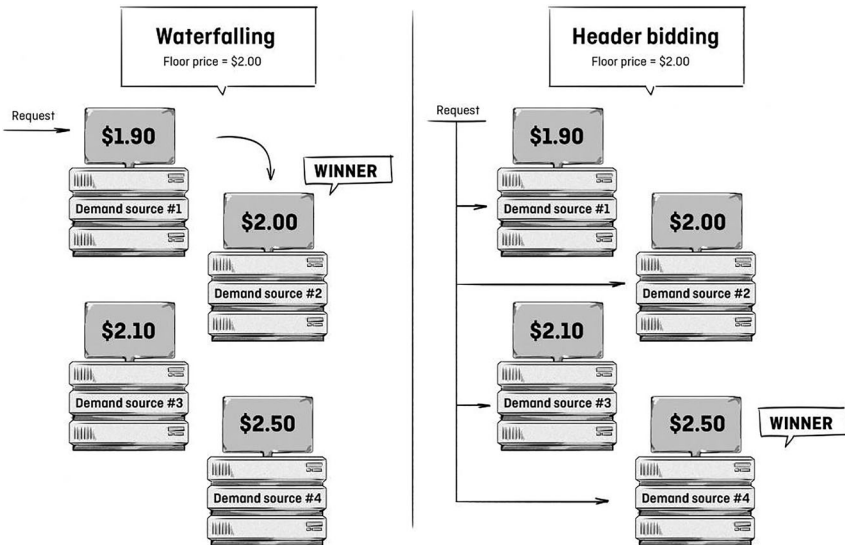


(Source: The Clearcode Blog)

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[97]Ibid.
[98]N. Maxwell, 'Header Bidding: Not Just for Publishers' Benefit' *AdExchanger* (29 April 2016) <https://adexchanger.com/data-driven-thinking/header-bidding-not-just-for-publishers-benefit/>.

It is thus not surprising that publishers implementing header bidding saw a significant increase in their ad revenues, sometimes up to 60%,[99] encouraging its widespread adoption and the emergence of software solutions provided by various companies that help publishers organize their demand partners in header bidding (called "wrappers").[100] Google, on the other hand, was less enthusiastic about this development.[101] An AppNexus director for example stated that "Google sees this [header bidding] as a massive threat to their dominance, and has no interest in having this adopted by the IAB [Interactive Advertising Bureau]".[102]

A potential downside of header bidding, however, is that it may increase page latency, i.e. the webpage of the publisher may take longer to load. In order to address page latency, some publishers turned to *server-side* header bidding,[103] where the pre-auction takes place in a remote server instead of the user's browser. While page loading time is improved, publishers generate *lower* revenue, partly because for technical reasons, buyers have less information about the user and thus do not bid as high as they otherwise would.[104] Furthermore, because the auction takes place in a server owned by a third-party (e.g. Amazon), there is a lack of transparency.

*Exchange bidding.* Exchange Bidding is Google's answer to header bidding,[105] announced as a feature of DFP in 2016 and made generally available for publishers in 2018.[106] Exchange Bidding allows publishers using DFP to connect third-party exchanges (so-called "yield partners")

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[99]Ibid.

[100]S. Sluis, 'The Year Header Bidding Went Mainstream' *AdExchanger* (27 December 2016) <https://adexchanger.com/publishers/year-header-bidding-went-mainstream/>. One of the most popular wrappers used by publishers is the open-source Prebid, originally developed by AppNexus. See S. Sluis, 'Header-bidding Wrappers: Another Step Toward the End of the Waterfall' *AdExchanger* (2 February 2016) <https://adexchanger.com/ad-exchange-news/header-bidding-wrappers-another-step-toward-the-end-of-the-waterfall/>.

[101]S. Sluis, 'AppNexus Strikes Back Against Google's Attempt To End Header Bidding' *AdExchanger* (17 May 2016) <https://adexchanger.com/ad-exchange-news/appnexus-strikes-back-against-googles-attempt-to-end-header-bidding/>.

[102]S. Sluis, 'Header-bidding Wrappers: Another Step Toward the End of the Waterfall', *supra* note 102.

[103]For an excellent overview of server-side header bidding, see S. Sluis, 'Header Bidding Goes Server-side: 6 Things You Should Know' *AdExchanger* (11 January 2017) <https://adexchanger.com/ad-exchange-news/header-bidding-goes-server-side-6-things-know/>.

[104]See *infra* 30.

[105]Commentators observe that Google introduced exchange bidding in order to 'quash' header bidding. See for example S. Sluis, 'AppNexus Strikes Back Against Google's Attempt To End Header Bidding', *supra* note 103.

[106]J. Hercher, 'Google's Answer to Header Bidding Is Now Generally Available' *AdExchanger* (4 April 2018) <https://adexchanger.com/ad-exchange-news/google-exchange-bidding-update-elevates-its-header-bidding-solution-solution/>.

to Ad Exchange via a server-to-server connection.[107] Each time an ad impression is available for sale, all competing exchanges submit their bids *simultaneously* in a *unified* auction hosted by DFP. This is the third auction that was described in our example above. Ad Exchange has no longer the "last look" advantage and faces real-time competition from these connected exchanges.[108] There is a caveat however: the removal of the last-look advantage concerns *only* the third-party exchanges that have accepted to integrate with AdX through the server-to-server connection. Thus, AdX retains its advantage for any ad exchange that does not participate in Exchange Bidding.

In effect, Exchange Bidding is just a form of *server-side* header bidding taking place on Google's servers, with the main difference being that it is easier to implement: the publisher simply enables the relevant option in DFP and does not need to obtain a wrapper.

Even though Exchange Bidding is arguably Google's effort to persuade publishers that there is no longer a need to use header bidding, commentators are concerned about the transparency of Google's solution, and express fears that Google could *still* favour its AdX in subtle ways. For instance, DFP may pass unique information to AdX regarding the audience that will be exposed to the ad, allowing it to solicit higher bids from advertisers than connected exchanges with "less" insight.[109] And in any event, AdX retains its advantage over exchanges refusing to participate in Exchange Bidding (e.g. out of distrust). Thus, publishers may still prefer to engage in *client-side* header bidding, which despite its latency problems, is transparent and promises high yields. What could be problematic, however, is *if* Google attempted to prevent publishers from engaging in client-side header bidding.

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[107]See <https://support.google.com/admanager/answer/7128453?hl=en&ref_topic=7512060>.
[108]S. Sluis, 'Google Removes Its 'Last-Look-Auction Advantage' *supra* note 95.
[109]L. O'Reily, 'Google is Working on a Lucrative New Ad Product, but Some People Who've Seen It Think It's a "Secret Tax" and It "Requires us to Lie"' *Business Insider* (2 August 2016) <http://uk.businessinsider.com/ad-tech-view-on-google-ebda-2016-7?r=US&IR=T>; J. Hercher, 'Google's Answer to Header Bidding Is Now Generally Available', *supra* note 108 (noting that according to an AppNexus's director, Exchange Bidding trades on the transparency offered by header-bidding integrations while keeping publishers 'locked in the AdX black box'); S. Sluis, 'Google Removes Its 'Last-Look- Auction Advantage', *supra* note 95 (noting that "Google will retain one additional advantage in the auction: It knows more about the user than it passes on to the other exchanges" and that "the shift to server-side solutions […] which make auctions run faster, also threaten to make the auctions lose transparency once again and replicate the last-look advantage"); B. LaRue, 'Last Stand for Google's "Last Look": What's Next?' *Admonsters* (31 March 2017) <www.admonsters.com/last-stand-googles-last-look-whats-next/> (noting that Exchange Bidding 'still comes out looking something like a black box, unified auction or no').

*Google's "Accelerated Mobile Pages" standard.* It may not be entirely clear at the outset why a reference to the AMP standard, Google's open-source initiative for a standardized designing and coding for websites displayed on mobile devices, is relevant to the present discussion. After all, AMP was introduced with the aim of making websites load faster when accessed via mobile.[110] That is assumed to be the case because AMP-compliant websites are coded using a stripped-down form of HTML, that eschews certain features and functionality that could slow page load times.

However, several features of the AMP standard make it relevant to our analysis of display advertising. First, AMP is designed in such a way that it is incompatible with traditional header bidding, i.e. client-side header bidding.[111] Publishers of AMP-compliant websites may still engage in server-side header bidding, but it is doubtful whether the latter can be regarded as a substitute for client-side header bidding. The reason is that server-side header bidding is characterized by a lack of transparency. As an industry expert notes:

> Server-side header bidding requires teamwork in a non-transparent environment […] what happens on the server is invisible to both the publisher and the buyers. It's possible that auctions could be conducted in a way where one demand partner gets preference or a final look. Or data could be leaked or hidden fees be taken.[112]

Moreover, cookie-matching is more complex and favours the vendor, i.e. the owner of the server-to-server connection. Complexities in cookie syncing translate into less user data being passed on to advertisers, which are thus less likely to submit a high bid. That in turn means less yield for publishers. As one industry observer notes "[t]here will be more auctions in the future in which the DSP doesn't know what it's buying, and that will do bad things for yield".[113]

Therefore, it seems that server-side header bidding might present the same problems which made client-side header bidding so popular among publishers, i.e. lack of transparency and the related concern of self-preferencing (e.g. DFP as a "black box", the "last look" advantage granted to Ad Exchange), as well as lower monetization.

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[110]Google, Inc., 'Introducing the Accelerated Mobile Pages Project, for a Faster, Open Mobile Web' (7 October 2015) <https://googleblog.blogspot.com/2015/10/introducing-accelerated-mobile-pages.html>.

[111]M. Chowla, 'How to Improve AMP Monetization with a Wrapper' (10 October 2018) <https://pubmatic.com/blog/improve-amp-monetization/> noting that '[b]ecause of the nature of AMP, only server-to-server (S2S) bidding is feasible'.

[112]S. Sluis, 'Header Bidding Goes Server-side: 6 Things You Should Know', *supra* note 105.

[113]Ibid.

There is, however, an additional problem posed by the AMP standard, which is that it is making it harder for publishers to compete with Google in offering targeting services to advertisers. As has been noted, the rise of programmatic advertising resulted in advertisers valuing user data (and the targeting possibilities they unlock) more than ever. Some publishers with wide readerships, such as leading newspapers, have attempted to build their own unique proprietary datasets about their audience in order to offer targeting services directly to advertisers, eliminating the need to resort to intermediaries such as Google.[114] However, such efforts are significantly undermined in the case of AMP. When the user visits an AMP-compliant page, the content of the page is fetched *not* from the publisher's servers, but from Google's servers, where it has been "cached". The result is that Google collects large troves of data associated with the users' interactions with the publisher's website. Google shares such data with the publisher in a format that prevents cross-site matching, i.e. the publisher cannot match users visiting different websites which belong to the same publisher. Publishers are thus unable to gather the necessary data to create longitudinal user profiles they need to offer attractive targeting services.

Of course, Google could claim that publishers do not have to comply with the AMP standard. But, in reality, publishers, especially news content providers, *have to* be AMP compliant, as otherwise they would lose the Internet traffic generated by Google searches. The reason is that Google only allows AMP-compliant webpages (designated as such with a lightning bolt icon and an "AMP" label) to appear in its News Carousel.[115] Moreover, mobile web pages that do not comply with the AMP standard will figure lower on Google SERPs, since as of July 2018 page speed has become "a major ranking factor for mobile searches".[116] Compliance with the AMP standard is thus effectively mandatory for

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[114]An example is The Ozone Project, where The Telegraph, The Guardian, News UK have developed a joint advertising platform (which Reach recently joined) to 'give advertisers access to participating publishers through one specialised sales team who can use "sophisticated targeting" methods across the different websites involved.' See <www.pressgazette.co.uk/joint-advertising-platform-becomes-truly-cross-industry-initiative-as-reach-unites-with-news-uk-guardian-and-telegraph/>.

[115]S. Whang, 'Google News is Getting Its Own Carousel of AMP Stories, and other AMP Features in the Works' (20 April 2016) <www.niemanlab.org/2016/04/google-news-is-getting-its-own-carousel-of-amp-stories-and-other-amp-features-in-the-works/> noting that '[t]he Google News headlines carousel will contain only AMP articles.' The News Carousel is a box appearing at the top of Google's search results in mobile, that displays news articles relevant to the user's query. Users can swipe left or right to navigate through the articles in the without having to scroll down on the page to view search results.

[116]A. Finn, 'Here's How the Google Speed Update Will Impact Your Site (& Google Ads Account)' (*The Wordstream Blog*) <www.wordstream.com/blog/ws/2018/01/22/google-speed-update> accessed 26 October 2018.

publishers given the importance of Google search as a source of referrals. For instance, data suggests that more than half (53%) of all referral traffic that digital publishers receive comes from Google search.[117]

## 2. Possible anti-competitive conducts

In this part we discuss certain types of conduct that could give rise to anti-competitive concerns in the ad intermediation and ad serving sector.

*Lack of transparency, hidden fees and exploitation.* At first, we look at possible ways in which an intermediary could *exploit* publishers and/or advertisers in breach of Article 102 TFEU, provided of course that the intermediary is found to be dominant.

What prompts us to look into potential exploitative practices are the various concerns that the traditional actors, i.e. publishers and advertisers, have expressed regarding the opaqueness of the sector and the fees charged by the operators that intermediate between them.[118] Publishers and advertisers have limited visibility into the precise functioning of the display advertising ecosystem.[119] There are widespread concerns in the advertising and publishing industry regarding this lack of transparency and the so-called "ad tech tax", i.e. the fees applied by various middlemen between publishers and advertisers.[120]

For instance, IAB found in a 2014 report that ad tech companies cumulatively capture 55% of programmatic revenues, the remaining 45% going to publishers.[121] WARC has estimated that in 2017 the "ad tech tax" accounted for 55% of all programmatic spend, leaving *less* than 36% for

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[117]See <www.parse.ly/resources/data-studies/referrer-dashboard/>.
[118]The CMO of P&G, one of the world's highest-spending advertisers, famously said in a 2017 IAB meeting that 'we're all wasting way too much time and money on a media supply chain with poor standards adoption, too many players grading their own homework, too many hidden touches, and too many holes to allow criminals to rip us off [...] We have a media supply chain that is murky at best and fraudulent at worst. [...] We serve ads to consumers through a non-transparent media supply chain with spotty compliance to common standards, unreliable measurement, hidden rebates and new inventions like bot and methbot fraud'. See L. Handley, 'Procter & Gamble Chief Marketer Slams "Crappy Media Supply Chain", Urges Marketers to Act' *CNBC* (31 January 2017) <www.cnbc.com/2017/01/31/procter-gamble-chief-marketer-slams-crappy-media-supply-chain.html>.
[119]See for example, J. Lee, 'Has Programmatic Finally Hit Bottom?' *AdExchanger* (29 July 2016) <https://adexchanger.com/data-driven-thinking/programmatic-finally-hit-bottom/> (noting that 'The advertiser isn't really clear on who actually saw the ad, where it was seen and who had to be paid along the way. There are many factors that contribute to this, including the poor quality of available inventory, open exchanges, fraud, nonviewable impressions and opaque daisy chain of technology').
[120]See *supra* note 10.
[121]IAB Programmatic Revenue Report 2014 Results, July 2015 <www.iab.net/media/file/PwC_IAB_Programmatic_Study.pdf>.

publishers, if ad fraud is taken into account.[122] As noted above, The Guardian revealed in 2016 that in a worst case scenario ad tech intermediaries could extract up to 70% of programmatic revenues. The Guardian filed a lawsuit in 2017 against ad exchange Rubicon Project over alleged undisclosed buyer fees,[123] but the parties settled.[124] The Select Committee on Communications appointed by the House of Lords, noted in its 2018 Report that according to a U.S. study, publishers end up receiving only 29% of programmatic revenues.[125] At the same time, commentators observe that it is almost impossible to determine precisely the fees charged by ad exchanges,[126] while DSPs apparently charge hidden fees.[127] It is thus not surprising that transparency is the number one concern for marketers in 2018.[128]

Besides the fees that are charged by intermediaries at every corner of the ad tech stack, industry commentators have also identified a particular feature of programmatic advertising that *could* be used by intermediaries to engage in arbitrage and thus exploit publishers and advertisers, which is the existence of consecutive second-price auctions.[129] The issue might at first glance seem irrelevant from a competition law perspective. However, if a *dominant* company were found to engage in such a practice, it could be considered as a form of exploitation in breach of Article 102(a) TFEU. In any event, it is worth exploring how there could be any arbitrage from the existence of consecutive auctions.

In a 2017 Digiday article, an industry expert observes that:

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[122]R. Benes, 'Why Tech Firms Obtain Most of the Money in Programmatic Ad Buys', *eMarketer* (16 April 2018) <www.emarketer.com/content/why-tech-firms-obtain-most-of-the-money-in-programmatic-purchases>.

[123]L. O'Reilly, 'The Guardian is Suing Ad Tech Company Rubicon Project' *Business Insider* (28 March 2017) <http://uk.businessinsider.com/guardian-takes-legal-action-against-rubicon-project-2017-3?r=US&IR=T>.

[124]L. O'Reilly, 'The Guardian and Ad-tech Vendor Rubicon Project Settle Legal Dispute' *The Wall Street Journal* (12 October 2018) <www.wsj.com/articles/the-guardian-and-ad-tech-vendor-rubicon-project-settle-legal-dispute-1539348209>.

[125]House of Lords, Select Committee on Communications, 1st Report of Session 2017–2019 'UK Advertising in a Digital Age' (11 April 2018) 15.

[126]S. Sluis, 'Explainer: More on the Widespread Fee Practice Behind the Guardian's Lawsuit Vs. Rubicon Project' *AdExchanger* (30 March 2017) <https://adexchanger.com/ad-exchange-news/explainer-widespread-fee-practice-behind-guardians-lawsuit-vs-rubicon-project/>.

[127]S. Sluis, 'Investigation: DSPs Charge Hidden Fees – And Many Can't Afford to Stop' *AdExchanger* (10 January 2018) <https://adexchanger.com/platforms/investigation-dsps-charge-hidden-fees-many-cant-afford-stop/>.

[128]J. Friedman, 'Programmatic Faces a Turning Point in 2018' *AdExchanger* (2 January 2018) <https://adexchanger.com/data-driven-thinking/programmatic-faces-turning-point-2018/>.

[129]I. Ivanov, 'There are No Losers When It Comes to First-price Auctions' *Digitaldougnut* (13 June 2018) <www.digitaldoughnut.com/articles/2018/june/there-are-no-losers-at-first-price-auctions>; M. Zawadzinski, 'Waterfalling, Header Bidding and New Auction Dynamics' (*The Clearcode Blog*) <https://clearcode.cc/blog/sequential-auctions-header-bidding-first-price-second-price-auctions/>.

For example, a DSP will tell a buyer that the exchange it is buying from uses first-price. The buyer is now under the impression that the bidding price will be the same as the price that wins the impression. In reality, the exchange uses second-price. The money in the middle – the difference between the cost of the impression and the buyer's bid – gets split between the programmatic platforms involved in the transaction. Hello, extra margin.[130]

The same expert gives in another article an example of how this "extra margin" could be created:

[I]f a buyer bids $10 in a DSP's internal auction and the second-lowest bid is $9, then the buyer will win the internal auction at $9.01. But if the second-highest bid in the open exchange is only $5, then the clearing price on the exchange will be $5.01. Rather than report back the $5.01 that the DSP bought the impression for, the DSP will report $9.01 back to the buyer and pocket the $4 in the middle, unbeknownst to most ad buyers, according to the DSP exec.[131]

Prima facie, Google appears to have the *ability* and *incentive* to engage in such a practice as illustrated by a hypothetical example, where an advertiser buys an ad impression through Google's AdWords, in line with the example analysed above.[132] In this setting, Google should be able to engage in arbitrage, given that both the first auction (within AdWords) and the second auction (within AdX) are second-price auctions.

Assume, for instance, that there are three advertisers in the AdWords auction: Advertiser 1 bids 10 € CPM, Advertiser 2 bids 12 € CPM (winner), and Advertiser 3 bids 11 € CPM.[133] Since the AdWords auction is second-price, the winning Advertiser 2 will be charged 11.01 € CPM. According to Google's support manager website,

if Google Ads [AdWords] wins the auction, the advertiser(s) in the winning ad unit will pay no more than what is required to rank higher than the next advertiser, on a CPC basis, when a user clicks on the ad or completes another valid event in connection with the ad.[134]

However, that is not necessarily the amount of money that the publisher will receive.

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[130]R. Benes, 'In programmatic, Buyers Sometimes Don't Know What Type of Auction They're Bidding in' *Digiday* (30 June 2017) <https://digiday.com/marketing/ad-buyers-programmatic-auction/>.
[131]R. Benes, 'Ad Buyer, Beware: How DSPs Sometimes Play Fast and Loose' *Digiday* (25 March 2017) <https://digiday.com/marketing/dsp-squeeze-buyers/>.
[132]See *supra* 19–20.
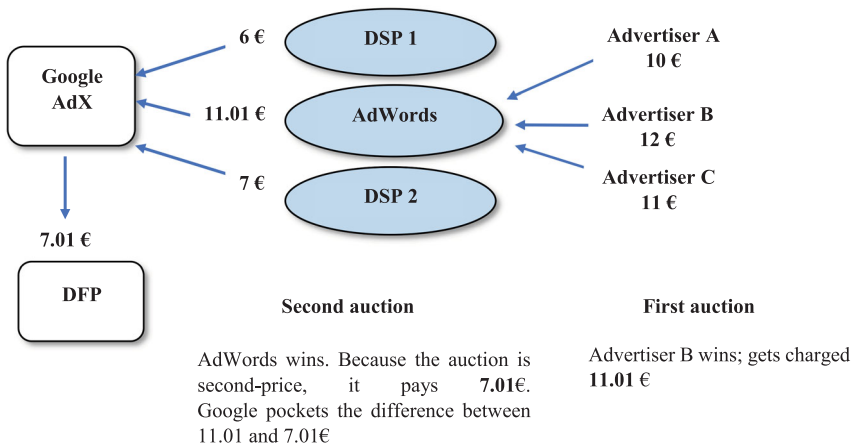[133]To be more precise, advertisers bid on a CPC basis. However, Google pays publishers on a CPM basis. In order to compare what is being paid to the publisher with what is being received by the advertiser, we express all bids on a CPM basis. In practice, there is a formula which can be used to translate the CPC price to a CPM price.
[134]<https://support.google.com/google-ads/answer/2472739?hl=en>.

The reason is that there is an additional second-price auction, organized by AdX, where other DSPs/ad networks compete with AdWords. For example, DSP 1 bids 7 € CPM, DSP 2 bids 5 € CPM, and AdWords bids 11.01 € CPM (winner). As the Ad Exchange auction is again *second-price,* the publisher will be paid slightly above the second highest bid, i.e. 7.01 € CPM.[135] In Google's support manager website, it is stated that "[t]he publisher will be paid the highest of the second highest bid value in the Ad Exchange auction or the minimum CPM".[136] That would allow the intermediary, in this case Google, to extract the difference between what the advertiser was charged and what the publisher receives at the end of the chain. Although such a practice could only be proved by analysing bidding data, it may be one of the reasons why publishers only capture a fraction of the prices paid by advertisers to purchase their ad inventory.

The following graph illustrates how arbitrage can arise in the context of successive second-price auctions:



Second auction

AdWords wins. Because the auction is second-price, it pays **7.01€**. Google pockets the difference between 11.01 and 7.01€

First auction

Advertiser B wins; gets charged **11.01 €**

The risk of exploitation would of course be less likely to arise if the ad tech market was competitive. In a competitive market, Google would be dissuaded from engaging in any form of exploitative conduct, as publishers

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[135]Another hypothesis is that AdWords could place a *lower* bid in AdX, not corresponding to the amount charged to the advertiser. This does not seem necessary, since the price paid to the publisher will be the same, regardless of the bid submitted by AdWords, given that the auction is second-price. However, such a practice could perhaps be useful in creating additional opacity and making it harder for publishers to find out the price charged to the advertiser.

[136]<https://support.google.com/google-ads/answer/2472739?hl=en>.

and/or advertisers could discipline AdX by not trading through it. More-over, intense competition between AdWords and competing ad networks/ DSPs within the auction organized by AdX would cut down the margin available for arbitrage. The example above illustrates that the opportunity for arbitrage is greater when the first auction yields a relatively high bid[137] *and* the second-highest bid in the second auction is materially lower.[138]

However, despite the continuing growth in online ad spend, the ad tech landscape is experiencing a consolidation phase, whereby independent ad tech firms struggle, venture capital investments is falling sharply, threatening to stall innovation, while Google and Facebook "solidif[y] their grip on digital dollars, slowing down revenues for others."[139]

*Vertical foreclosure/self-preferencing.* As illustrated by the *Google Shopping* decision of the Commission, competition problems may arise when a firm that owns a dominant platform (Google Search) competes on a downstream market (comparison shopping services) with other firms that need to have access to the dominant platform to provide their services.[140] In that decision, the Commission found that Google abused its dominant position by systematically giving prominent

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[137]That does not seem to be a problem, given AdWords' prominence as an ad network. It is also possible that Google takes advantage of its prominence on *search* advertising and uses a form of 'status quo bias' to artificially create more competition among advertisers on *display* advertising, thus leading to higher prices. AdWords is also the 'gateway' for search advertising on Google's SERPs. However, an advertiser bidding for a campaign in AdWords is <u>by default</u> (and unless she opts out) bidding for both search ads in Google's SERPs and for display ads in the Google Display Network. That drives up demand for Google Display Network, even if the advertiser does not realize it. See D. Pratt, '7 Default Settings in AdWords that Lower Your ROI' *AdHawk* (18 June 2018) <https://blog.tryadhawk.com/google-adwords/4-default-settings-in-adwords-that-lower-your-roi/>.

[138]Again, that could be the case because e.g. AdWords has more data about the user compared to other ad networks/DSPs. According to Google, when AdWords is used to buy inventory on Ad Exchange, there is minimal cookie matching loss from Ad Exchange to AdWords, to the effect that 'there is a higher likelihood AdWords will find impressions that meet the targeting criteria of advertisers, creating greater auction pressure and demand for the publisher's inventory.' See <https://support.google.com/admanager/answer/7014770?hl=en>. Moreover, it has been suggested that competition in the auction organized by AdX is much weaker than one would assume: see C. Cummings, 'Google's Busted Auctions' (*PubNation Blog*, 22 June 2016) <www.pubnation.com/blog/googles-busted-auctions> (noting that on average there were only *six* bids per impression on Ad Exchange and that the gap between the winning bid and the second-highest bid could be 'enormous', up to 70% off the winning bid).

[139]C. Ballentine, 'Google-Facebook Dominance Hurts Ad Tech Firms, Speeding Consolidation' *The New York Times* (12 August 2018) <www.nytimes.com/2018/08/12/technology/google-facebook-dominance-hurts-ad-tech-firms-speeding-consolidation.html> See also C. Ballentine, 'Investment in Ad Tech Grows Increasingly Scarce, With Forrester Predicting a 75% Drop in Venture Capital' *Adweek* (7 November 2018) <www.adweek.com/programmatic/investment-in-ad-tech-grows-increasingly-scarce-with-forrester-predicting-a-75-drop-in-venture-capital/> noting that '[p]art of the concern among investors is the consolidation of ad spend on platforms such as Facebook and Google. Jay Friedman, president of Goodway Group, explained to Adweek that the historic opaque business models of many ad-tech companies have prompted media buyers to be more prudent.'

[140]Press Release, 'Antitrust: Commission Fines Google €2.42 Billion for Abusing Dominance as Search Engine by Giving Illegal Advantage to Own Comparison Shopping Service', IP/17/1784, 27 June 2017.

placement to its own comparison-shopping service in its search results, while demoting rival comparison shopping services in these results. The abusive conduct identified by the Commission has been labelled as "self-preferencing" in that Google used its dominant platform to give a competitive advantage to its comparison-shopping services over rival services.

A related concern seems to have led the Commission and the German Competition Authority to recently launch a preliminary investigation of Amazon's e-commerce platform.[141] While little is known about that investigation, it seems to be focused on Amazon's dual role as a competitor, but also host, to third-party merchants, which sell goods on Amazon's websites. Because of this dual role Amazon has access to valuable data on the availability, prices, return rates and popularity of competitors' products, which it could potentially use to stimulate its own retail activities at the expense of third-party sellers on its marketplace.

The fact that Google is, as we have seen above, both the organizer of the (final) auction (in DFP) *and* participating in the auction (in the form of AdX) gives rise to similar kinds of concerns as those identified in the *Google Shopping* decision and the *Amazon* preliminary investigation. This problem is not new. Already in the context of the *Google / Double-Click* merger in 2008, stakeholders had expressed concerns that Google could use DFP to favour its own intermediation services, e.g. by tweaking the auction mechanism in favour of AdSense, Google's ad network, thus depriving competing ad networks and exchanges from the critical scale and liquidity they need to be sustainable.[142] At the time, the Commission rejected these arguments, repeating that Google would have the incentive to act neutrally vis-à-vis competing intermediaries, as a lack of neutrality could cause customers switching. The problem is that in the meantime Google has largely monopolized the ad tech value chain, and that the type of constraints identified by the Commission in 2008 no longer exist.

Earlier manifestations of Google's self-preferencing were the "real-time-demand" advantage and the so-called "last-look" advantage DFP granted to AdX discussed in sub-section 1 above. DFP would grant exclusively to AdX the possibility to take real-time demand into account, hence distorting competition between exchanges to the detriment of publishers.

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[141]R. Toplensky and S. Shannon Bond, 'EU Opens Probe into Amazon Use of Data About Merchants' *Financial Times* (19 September 2018) <www.ft.com/content/a8c78888-bc0f-11e8-8274-55b72926558f>; R. Toplensky, 'German Cartel Office Launches Investigation into Amazon Marketplace' *Financial Times* (29 November 2018) <www.ft.com/content/ed2d1980-f3ef-11e8-ae55-df4bf40f9d0d>.

[142]Decision of 11 March 2008, COMP/M.4731, Google/DoubleClick, para 290.

This form of self-preferencing happens even after the introduction of Exchange Bidding, as regards exchanges that have *not* connected to AdX.

In addition to this problem, concerns have been expressed that Google might use the information gathered by DFP to favour AdX. As expressed by an industry observer:

> Google relied on the informational advantage (DFP + AdX integration) to "cherry-pick" inventory in mysterious, but decidedly underhanded ways. According to an ad tech executive who wished to remain anonymous, "AdX always won the impression if the user happened to be at the end-of-funnel stage in a purchase journey, essentially stealing attributions from other exchanges. On paper, it went on to show advertisers that DBM (DoubleClick Bid Manager) with AdX inventory gave them better results than any other platforms".[143]

These observations remain relevant even after the introduction of Exchange Bidding. The reality is that DFP possesses vast amounts of historical data regarding the bids submitted for particular impressions by competing ad exchanges and the price at which the impression is finally sold, since there could be millions of impressions being sold every day and DFP is admittedly by far the most popular ad server solution. The informational advantage could thus be still present, and it is not possible to monitor whether AdX may use such historical data amassed by DFP to calculate the appropriate bid to win the auction.

Commentators have also taken issue with the fact that Exchange Bidding lacks transparency, a reason why competing ad exchanges are reluctant to participate in Exchange Bidding. An author notes that:

> Demand partners often take pause at jumping into an S2S connection [server-to-server] managed by someone else, especially when that "someone else" is a competitor. In managing the server-side connection, Google ultimately decides what data goes into EBDA [Exchange Bidding]. There are issues in S2S related to ID-syncing between buy and sell sides, and from publisher to publisher. Google might find an advantage for itself in those ID issues, not just because it's managing the server-side connection, but because of its unparalleled scale. So, EBDA still comes out looking something like a black box, unified auction or no.[144]

Interestingly, Google has abandoned any attempt to give the impression that DFP might deal with AdX on an arm's length basis when it announced, in July 2018, the integration of AdX and DFP into Google

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[143]P. Dinodia, 'Everything You Need to Know About DFP Dynamic Allocation', *supra* note 94.
[144]B. LaRue, 'Last Stand for Google's "Last Look": What's Next?', *supra* note 111.

Ad Manager, offering a "truly unified platform".[145] This led an industry commentator to observe that:

> my guess is that the top goal is to try and wean publishers off of header integrations and get them hooked on EBDA demand. It seems funny to me that there's no longer even a pretense of separation between ad server and SSP/exchange. The name change re-emphasizes that Google will leverage its near-monopolistic control of the publisher ad server market to shoo away other demand sources—whether or not that's good for the publisher or the advertiser. […] It's another attempt to squeeze out competition and keep publishers (and advertisers) sucking at the Google teat.[146]

In our view, Google's conduct falls neatly into the vertical foreclosure category of abuse of a dominant position identified by the Commission in its *Google Shopping* decision, but also in earlier decisions. The abuse here is that Google uses its dominant position in the ad server market with the vast majority of publishers locked in DFP to distort competition between different ad exchanges to the benefit of its own exchange. This weakens competition in the ad exchanges market to the detriment of publishers.

*Vertical foreclosure/coercion.* As discussed above, in reaction to DFP's dynamic allocation and in order to stimulate true competition between ad exchanges, publishers resorted to header bidding, which exposed AdX to real-time competition from connected exchanges. Google responded to header bidding by launching Exchange Bidding, which allows all connected exchanges to compete in a unified auction hosted by DFP. However, it also seems that Google undermined header bidding through the development of AMP. The reason is that, as noted above, client-side header bidding is not possible in AMP-compliant websites for technical reasons. Moreover, by requiring that all AMP pages are loaded on its servers, Google does not only allow itself to collect all the data associated with the users' interactions with publisher, but it also makes it harder for these publishers to obtain access to this data by restricting access to it.

In our view, Google's strategy with AMP amounts to another form of vertical foreclosure, whereby Google leverages its dominance in general search to coerce publishers to adopt a conduct (making their mobile pages compliant to the AMP standard), which – while it benefits Google – is fundamentally at odds with their interest.

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[145]'Introducing Google Ad Manager' <www.blog.google/products/admanager/introducing-google-ad-manager/>.

[146]G. Dunaway, 'Death of DoubleClick, Birth of a Monster?' *Admonsters* (3 July 2018) <www.admonsters.com/death-doubleclick-google-ad-manager/>.

Google's strategy is not unlike the conduct at stake in the *Android* decision where the Commission considered that Google had illegally tied its Search and browser (Chrome) apps to its app store (the Play Store), thus effectively coercing Android device makers to preload the Search and Chrome apps on their devices.[147] In that case, while Android device makers were theoretically not bound to preload Google's suite of applications to develop an Android device, a refusal to do so would have made these devices commercially unsalable as they would have been deprived of the Play Store, which is a "must have" for all Android users.[148] In its decision, the Commission found that Google's conduct breached Article 102 TFEU and condemned Google to a significant fine.

Similarly, in the present case, while publishers do not have to comply with the AMP standard, they have no choice but to be AMP-compliant despite the fact it undermines header-bidding and harms their ability to collect the type of data that would allow them to bypass the Google's tech stack and sell targeted audiences directly to advertisers. In our view, this conduct could breach Article 102 TFEU.

## IV. Conclusions

Online display advertising is a sector of critical importance to both advertisers and publishers. But for their display advertising revenues, even the world's leading newspapers would not be commercially viable. While online display advertising was originally not very different from its offline equivalent as most inventory was sold through bilateral negotiations between publishers and advertisers, the rise of programmatic advertising has had profound implications on the industry. Programmatic advertising has been a source of opportunities for advertisers and publishers, but the fees charged by intermediaries are opaque, hence amounting to what is perceived as ad tech tax. While ad tech markets are populated by a variety of actors, Google appears to hold a dominant position on several such markets, and several of its conducts raise exploitative and exclusionary concerns potentially in breach of Article 102 TFEU.

The French and German competition authorities are looking closely at the online display advertising sector and, given their investigative powers,

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[147]Press release, 'Antitrust: Commission Fines Google €4.34 Billion for Illegal Practices Regarding Android Mobile Devices to Strengthen Dominance of Google's Search Engine', 18 July 2018.

[148]See B. Edelman and D. Geradin, 'Android and Competition Law: Exploring and Assessing Google's Practices in Mobile' (2016) 12 *European Competition Journal* 159, SSRN: <https://ssrn.com/abstract=2833476>.

they should be able to collect the data, including bidding data, required to further explore the competition issues existing in the sector. Other national competition authorities may follow suit under the pressure brought by advertisers and publishers. If multiple investigations are initiated at the Member State level, it may be ultimately desirable for the European Commission to intervene to prevent the adoption of incompatible decisions and remedies.

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## Disclosure statement

The authors represent news publishers on a variety competition law issues, including some linked to online advertising. This paper was written at the authors' initiative and represents their own personal views only. It is based on extensive research of publicly available materials.

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## Annex

### *Explaining step-by-step the programmatic delivery of ads with DFP*

(1) The user types in its browser the URL of the publisher webpage (e.g. the webpage of the Wall Street Journal). In our example we assume that the user is John, lives in France, is 30 years old and is interested in cars.

(2) The browser calls the content server of the publisher webpage. The content server sends the content of the webpage, which has a pre-defined empty space to be filled with an ad. The web server "tells" the browser to call DFP for the ad that will fill the available space.

(3) In case the publisher has resorted to header bidding, a pre-auction will take place *before* the page starts to load and *before* DFP is called by the browser. In *client-side* header bidding, the browser contacts directly all the demand partners (ad exchanges/SSPs) the publisher has configured and runs a simultaneous auction. In *server-side* header bidding, the browser contacts only one demand partner, which in turn contacts the other demand partners and runs the auction on its server. In both cases, the winning bid will be sent by the browser to DFP where it will be matched with a remnant line item.

(4) The browser contacts DFP sending an **ad tag**. An ad tag is a snippet of code (usually HTML) contained in the publisher webpage that contains information about the ad space that is up for sale and the user that will be exposed to the ad.

(5) DFP examines the received information and finds the line items which are compatible.

(6) DFP ranks line items according to certain criteria. Guaranteed line items rank ahead of remnant line items.[149] DFP selects the highest-ranking *guaranteed* line item and the highest-ranking *remnant* line item (which could be the winning bid from header bidding, if such pre-auction has taken place).

(7) DFP assigns the guaranteed line item a price (called "**temporary CPM**") that does not necessarily coincide with the actual CPM of the line item. That process opens the guaranteed line item to competition from AdX bids, in order to maximize publisher revenues.[150] The reason that DFP assign a temporary CPM is to ensure that the delivery of the guaranteed line items agreed between the publisher and the advertiser will not be compromised. DFP assigns a temporary CPM that reflects the progress of guaranteed line item's delivery: if the guaranteed line item is behind schedule, a higher temporary CPM is assigned to boost its possibility of winning and being delivered. If the guaranteed line item is close to reaching its delivery goal, the temporary CPM assigned will be lower.

(8) DFP sends bid request (along with information derived from the ad tag) to AdX to solicit bid responses that will compete with the guaranteed line item and the remnant line item selected. The higher of the temporary CPM of the top guaranteed line item and of the CPM of the top remnant line item is set as a price floor on the auction run by AdX. AdX has thus "last look", i.e. it can beat any line item if it solicits a slightly higher bid.

(9) If the publisher has enabled Exchange Bidding, the publisher may connect AdX with third-party ad exchanges (called "yield partners") that will compete with AdX in a unified auction. In such a case, Google's AdX sends the bid request to competing ad exchanges through a "server-to-server" connection. AdX has no "last-look" advantage vis-à-vis these connected third party exchanges, but keeps it vis-à-vis other exchanges.

(10) Google's own AdX and third-party ad exchanges run auctions to determine the bid each of them will submit for the particular ad impression.

(11) This procedure in fact includes multiple auctions. For example, AdX is connected to several DSPs and ad networks, including AdWords. Each DSP/ad network will run its own auction to determine the bid it will submit to the auction organized by AdX. The data regarding the ad slot and the user help DSPs gauge how much they are willing to bid. For instance, a DSP that manages the campaign of a car manufacturer targeting young men living in France will decide to bid higher. Once DSPs have submitted their bids, AdX runs a second-price auction and selects the DSP with the highest bid. Since the auction is second-price, the winning bidder will pay not what it actually

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[149]Guaranteed line items are *reserved* i.e. they have been reserved to a particular advertiser in the context of a *direct sale*, whereby the publisher has guaranteed their delivery within a time period or until a certain level of impressions has been reached. On the contrary, remnant line items are line items whose delivery has not been guaranteed by the publisher.

[150]For instance, it is possible that in a particular case an advertiser is interested in displaying its ad to the targeted individual, so that he is willing to pay more than what the advertiser of the guaranteed line item has agreed to pay.

bids, but just slightly more (e.g. 1 cent) than the second highest bidder. For example, DSP1 bids 2.10 € CPM, DSP2 bids 2.50 € CPM and DSP3 bids 1.90 € CPM. The winning bidder, i.e. DSP2 will in fact pay 2.11 € CPM, not 2.50 € CPM.

(12) Once AdX and the competing ad exchanges have run their own auctions, each of them submits its highest bid. In our example, AdX will submit a bid for 2.11 € CPM.

(13) DFP then hosts a unified auction, where the bids from competing ad exchanges and AdX compete with the higher of the CPM of the top remnant line item and the temporary CPM of the top guaranteed line item. The highest bidder wins and gets to serve the ad.

(14) Once the highest bidder is determined, DFP contacts the browser and tells it to fetch the creative content that will fill the ad space from the ad server of the advertiser that won.

(15) The browser calls the ad server of the winning advertiser and serves the creative content on the webpage of the publisher.